TDAS

Tunisian Decision Aid Society

Conference Proceedings

ABSTRACTS

Presented at the

The 2016 International Conference on Decision Aid Sciences and Applications (DASA'16)

18th – 20th July, 2016, Hammamet, Tunisia

This conference is sponsored by

TUNIS BUSINESS SCHOOL
UNIVERSITY OF TUNIS

IHE TUNIS PARIS

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1. Introduction

The Tunisian Decision Aid Society organizes the international conference on Decision Aid Sciences and Applications (DASA'16). The conference is an interdisciplinary forum for the presentation of recent developments and applications in the field of Decision Aid Sciences. This Conference aims to disseminate recent models and techniques related to decision making and decision processes through researchers and practitioners from all over the world.

This year we have over 110 papers, 3 Doctoral Workshops, 2 Keynote Speeches and more than 160 qualified national and international speakers, representing almost 21 countries, presenting their knowledge about Decision Aid Sciences and Applications.

2. Conference Tracks

Track 1: Multiple Criteria Decision Aid

Chair: Taicir Moalla Loukil, Faculty of Business Administration, Tabuk University, KSA

(tmoalla@ut.edu.sa)

Co-Chair: Mohamed Ayman Boujelben, Research unit MODEOR, University of Sfax, Tunisia

(ayman_boujelben@yahoo.fr)

Track 2: Decision Making in Production and Service Management

Chairs: Imed Kacem, Lorraine University, France (imed.kacem@univ-lorraine.fr)

Ridha Mahjoub, University Paris-Dauphine, France (mahjoub@lamsade.dauphine.fr)

Track 3: Decision Aid in Supply Chain Management

Chairs: Saoussen Krichen, University of Tunis, Tunisia (krichen_s@yahoo.fr)

Chen Yen-Tsang, NEOMA Business School, France (yen-tsang.chen@neoma-bs.fr)

Track 4: Decision and logistics

Chair: Ghassan Abu-Lebdeh, American University of Sharjah, UAE (gabulebdeh@aus.edu)

Track 5: Statistical Decision Making and Statistical Analysis

Chair: Mohamed Limam, University of Dhofar, Sultanate of Oman (mohamedmtlimam@gmail.com)

Track 6: Financial Decision Making

Chairs: Sabri Boubaker, Champagne School of Management (Groupe ESC Troyes) & IRG, Université Paris Est, France (sabri.boubaker@get-mail.fr)

Khaled Guesmi, IPAG Business School, France (Khaled.guesmi@ipag.fr)

Duc Khuong Nguyen, IPAG Business School, France (duc.nguyen@ipag.fr)

Track 7: Decision Models in Marketing

Chair: Volker Kuppelwieser, NEOMA Business School, France (Volker.KUPPELWIESER@neoma-bs.fr)

Track 8: Decision Models in Human Resource Management

Chair: Nizar Mansour, Emirates College of Technology, UAE (nizar.mansour@ect.ac.ae)

Track 9: Decision Aid in Accounting and Auditing

Chair: Khamoussi Halioui, Al-Imam Muhammed Ibn Saud Islamic University at Riyadh, KSA (khamoussi.halioui@gmail.com)

Co- Chair: Khelif Hichem, University of Monastir, Tunisia (hichemkhlif@gmail.com)

Track 10: Decision and Uncertainty

Chair: Hatem Masri, University of Bahrain, Kingdom of Bahrain (hmasri@uob.edu.bh)

3. Roundtable

The TDAS Roundtable session goal is to contribute to the development of conceptual frameworks, teaching methods, technology solutions, and curricular materials that can support and promote learning and understanding of Decision Sciences in multiple fields. This year, we will be joined by many speakers from all over the world as they collectively bring you up-to-date knowledge and experience coupled with lots of thought-provoking opinions and ideas to be shared.

The title of this year's Roundtable is "Combining local impact and global relevance to make impactful decisions". It will focus on Business education in the Arab region sits at the crossroad between regional impact and global relevance.

A group of four experts will share their experiences about how business schools have adapted their operating models and initiatives to make a lasting impact in the Arab region and to address chronic socioeconomic issues such as unemployment, healthcare, poverty and inclusiveness. The moderator is Dr. Karim Seghir, Dean of the School of Business at the American University in Cairo.

4. TDAS Lifetime Achievement Award

This Lifetime Achievement Award is intended to honor the highest level of achievement in Decision Aid by a business leader. It is an annual award and it is only given when an appropriate honoree is available. The honoree receives a suitable plaque and he/she is invited to give a lecture at the DASA Conference.

The TDAS Lifetime Achievement Award Committee is composed of the Executive Committee of the TDAS Board of Directors.

5. Publications Opportunities

1.	**INFOR: Information Systems and Operational Research**
	Journal website: http://www.utpjournals.press/loi/infor Issue title: Multidimensional Perspectives in Finance and Investment Deadline for Full Paper Submission: 1 October 2016 Guest Editor: • David Pla-Santamaria, Polytechnical University of Valencia, Spain (dplasan@upv.es) • Fouad Abdelaziz, NEOMA Business School. France (fouad.ben.abdelaziz@neoma-bs.fr) • Hatem Masri, University of Bahrain, Bahrain (hmasri@uob.edu.bh) Papers for consideration should be submitted via the Editorial Manager Submission site (http://www.edmgr.com/tinf). Please indicate a special-issue submission when you upload your paper.
2.	**RAIRO – Operations Research**
	Journal website: http://journals.cambridge.org/action/displayJournal?jid=ROE Deadline for Full Paper Submission: 1 October 2016 Editor: Ridha Mahjoub, University Paris-Dauphine, France (mahjoub@lamsade.dauphine.fr) Papers for consideration should be submitted via the Editorial Manager Submission site (http://www.editorialmanager.com/ro/default.aspx) Please indicate when you submit your paper that your paper was presented in DASA'16 to benefit from a fast evaluation process.
3.	**Research in International Business and Finance**
	Journal website: http://www.journals.elsevier.com/research-in-international-business-and-finance/ Deadline for Full Paper Submission: 1 October 2016 In consultation with the managing editors, authors of selected papers will be invited to submit their papers to a regular issue of these journals.

For more information, please contact

- Sabri Boubaker, Champagne School of Management (Groupe ESC Troyes) & IRG, Université Paris Est, France (sabri.boubaker@get-mail.fr)
- Duc Khuong Nguyen, IPAG Business School, France (duc.nguyen@ipag.fr)

4. The International Journal of Multicriteria Decision Making

Journal website: http://www.inderscience.com/jhome.php?jcode=ijmcdm

Issue title: Multidimensional Perspectives in Finance and Investment

Deadline for Full Paper Submission: 31 August 2016

Topics may include, but are not limited to:

- Advances in MCDA Theory, New Approaches and Decision Support Systems.
- Preference Elicitation and Modeling.
- Handling imperfect data in MCDA.
- Group Decision Making.
- Multiobjective Optimization.
- MO Hybrid/Parallel metaheuristics.
- Interactive methods.
- Fuzzy and stochastic Multiobjective Optimization programming.
- Goal Programming.
- Applications of MCDA and Multiobjective Optimization to Planning and scheduling, Logistic and routing problems, Time tabling, Cutting problem, Knapsack problems, Portfolio optimization, Set covering, clustering, packing, Datamining, Health and environment and Bioinformatics.

Special Issue Editors:

- Taicir Moalla Loukil, Faculty of Business Administration, Tabuk University, KSA (tmoalla@ut.edu.sa)
- Mohamed Ayman Boujelben, Research unit MODEOR, University of Sfax, Tunisia (ayman_boujelben@yahoo.fr)

Manuscripts should be submitted via the Editorial System http://www.inderscience.com/ijmcdm. Please indicate when you submit your paper that your paper was presented in DASA'16 to benefit from a fast evaluation process. For more details contact the special issue editors.

5.	**Journal of Optimization Theory and Applications**
	Journal web site: http://www.springer.com/mathematics/journal/10957 Deadline for Full Paper Submission: 1 October 2016 In consultation with the managing editors, authors of good research papers will be invited to submit their papers to a regular issue of this journals. For more information, please contact, Taicir Moalla Loukil, Faculty of Business Administration, Tabuk University, KSA (tmoalla@ut.edu.sa)
6.	**International Journal of Services and Operations Management**
	Journal web site: http://www.inderscience.com/jhome.php?jcode=ijsom Issue title: Economics and Business Engineering Deadline for Full Paper Submission: 30 December 2016 Special Issue Editors: • Hatem Masri, University of Bahrain, Kingdom of Bahrain • Fouad Ben Abdelaziz, NEOMA business school, Rouen Campus, France The special issue topics include, but are not limited to, all areas of Business Engineering, in particular those addressing the conference theme • Business Process Engineering • Financial Engineering Economy • Supply Chain Management • Decision Analysis and Methods • Operation Research • Modeling and Simulation Papers for consideration should be submitted via INDERSCIENCE Editorial Manager Submission site. Please indicate the special-issue submission when you upload your paper.
7.	**International Journal of Information and Decision Sciences**
	Journal web site: http://www.inderscience.com/jhome.php?jcode=ijids Deadline for Full Paper Submission: 1 October 2016 Special Issue Editor: Ghassan Abu-Lebdeh, American University of Sharjah, UAE (gabulebdeh@aus.edu)

	Papers for consideration should be submitted via INDERSCIENCE Editorial Manager Submission site. Please indicate when you submit your paper that your paper was presented in DASA'16. For more information, please contact the special issue editor.
8.	**Frontiers in Finance and Economics**
	Journal website: https://ffejournal.wordpress.com/online-papers/ In consultation with the managing editors, authors of selected papers will be invited to submit their papers to a regular issue of these journals. For more information, please contact • Sabri Boubaker, Champagne School of Management (Groupe ESC Troyes) & IRG, Université Paris Est, France (sabri.boubaker@get-mail.fr) • Duc Khuong Nguyen, IPAG Business School, France (duc.nguyen@ipag.fr)
9.	**Journal of Empirical Research in Accounting & Auditing**
	Journal website: http://www.uob.edu.bh/english/pages.aspx?module=pages&id=3360&SID=768 Deadline for Full Paper Submission: 30 October 2016 Special Issue Editor: Khamoussi Halioui, Al-Imam Muhammed Ibn Saud Islamic University at Riyadh, KSA (khamoussi.halioui@gmail.com) Papers for consideration should be submitted by email to the special issue editor.
10.	**Gestion 2000 - For papers written in French language**
	Journal website: http://gestion2000.ichec.be/ Deadline for Full Paper Submission: 1 October 2016 Editor: Khaled Guesmi, IPAG Business School, France (Khaled.guesmi@ipag.fr) Papers for consideration should be submitted by email to the special issue editor.
11.	**CONTRIBUTED BOOK to be published by Springer under the Edited Series Multiple Criteria Decision Making**
	Issue title: Financial Decision Aid using Multiple Criteria Models **Recommended topics include, but are not limited to, the following:** ▪ Multi-Criteria Decision Aid in Finance ▪ Multiple Objective Programming in Finance ▪ Multiple Objective stochastic Programming in Finance ▪ Multiple Objective Fuzzy Programming in Finance

- Other Multiple Criteria Decision models in Finance

Submission information:

November 15, 2016: Proposal Submission Deadline

December 15, 2016: Notification of Acceptance

February 28, 2017: Full Chapter Submission

April 30, 2017: Review Results to Authors

June 15, 2017: Revised Chapter Submission

September 30, 2017: Final Acceptance Notifications

Editorial information:

- Hatem Masri, University of Bahrain, Bahrain (hmasri@uob.edu.bh)
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- Constantin Zopounidis, Technical University of Crete, Greece (kostas@dpem.tuc.gr)

6. Committees

General Chair: Fouad Ben Abdeaziz, NEOMA Business School, France

Program Chair: Hatem Masri, University of Bahrain, Bahrain

Financial Chair: Saleh Ben Abdallah, University of Tunis, Tunisia

Organizing Committee Chair: Rimeh El Fayedh, University of Carthage, Tunisia

Members of the Organizing Committee: Meryem Masmoudi, University of Bahrain, Bahrain

Houda Alaya, University of Tunis, Tunisia

7. The Conference Program

MONDAY 18/07/2016	
13.00 - 15.00	**Conference Registration**
15.00 - 15.40	**Doctoral Workshop 1**
	The Impacts of Transport Decision Systems on Public Health: Issues and Challenges
	Ghassan Abu-Lebdeh
	Amphitheatre Caesar
15.40 - 16.00	**COFFEE BREAK**
16.00 - 16.40	**Doctoral Workshop 2**
	Approximation Techniques for Hard Cobinatorial Optimization Problems
	Imed Kacem
	Amphitheatre Caesar
16.40 - 17.20	**Doctoral Workshop 3**
	Decision Aid Sciences in Information Technology: A Success Factor or a Challenge
	Nabil El Kadhi
	Amphitheatre Caesar
17.20 - 18.00	**TDAS Meeting**
TUESDAY 19/07/2016	
8.00 - 9.00	**Conference Registration**
9.00 - 9.20	**Opening Ceremony**
	Prof. Hmaid Ben Aziza, President of the University of Tunis
	Amphitheatre Caesar
9.20 - 10.00	**Keynote Speech 1**
	Open and Current Research Questions in Marketing – a Chance for Decision Science Researchers to Step in?
	Volker G. Kuppelwieser
	Amphitheatre Caesar
10.00 - 10.20	**COFFEE BREAK**

	A1: Investment and Efficiency (Chair: Hédi Essid)
	Amphitheatre Caesar
10.20 - 10.40	The Analysis of Energy Efficiency of Mediterranean Countries: A Two Stage Double Bootstrap DEA Approach
	Eya Jebali and Hédi Essid
10.40 - 11.00	Assessing the efficiency of Tunisian schools: A data envelopment analysis approach with non-discretionary inputs and undesirable outputs
	Fatma Benyahia and Hédi Essid
11.00 - 11.20	Ethical investment performance: Evidence from the portfolio theory perspective
	Noureddine Kouaissah, Marianna Cavenago, Sergio Ortobelli and Silvana Signori
11.20 - 11.40	Technical efficiency of socially responsible mutual funds in Canada
	Abdelouahid Assaidi and Mohamed Dia
	A2: Financial markets 1 (Chair: Khaled Guesmi)
	Caesar 1
10.20 - 10.40	Measuring of international financial integration with a multicriteria decision aid approach
	Monaem Tarchoun and Zouari Ezzeddine
10.40 - 11.00	Multi agent systems for modeling information game in financial market
	Fatma Mrad and Fouad Ben Abdelaziz
11.00 - 11.20	Preliminary Study on Stakeholders' Needs and Requirements to Improve Maintenance Performances
	Nouha Lahiani and **Kouami Seli Apedome**
11.20 - 11.40	On the Instability of Tunisian Money Demand
	Nidhal Mgadmi, **Houssem Rachdi**, Khaled Guesmi and Hichem Saidi
	A3: Decision and logistics (Chair: Salah Ben Abdallah)
	Caesar 2
10.20 - 10.40	Enabling Accurate Travel Time Prediction on Urban Interrupted Flow Facilities with Neural Networks Using Conventional Data
	Ghassan Abu-Lebdeh
10.40 - 11.00	An Optimization-Based Decision Support For Urban Transportation Planning In Grand Tunis
	Bochra Rabbouch and Rafaa Mraihi
11.00 - 11.20	Interest of the multidimensional analysis to evaluate the quality of service of urban public transport
	Leila Kharrat and Younes Boujelbène
11.20 - 11.40	The household management problem: A literature review
	Masri Hatem, Argoubi Majdi and **Jammeli Haifa**
	A4: Decision Making in Supply Chain Management 1 (Chair: Samir Elhedhli)
	Caesar 3
10.20 - 10.40	Identifying of the supply chain performance factors
	Dorra Dridi and Younes Boujelbenne
10.40 - 11.00	Risk management in petroleum supply chain : A review
	Rawdha Ben Amor and Ahmed Ghorbel
11.00 - 11.20	Bi-level Optimization of the Supply Chain of Oil in Smart Cities
	Sofiene Abidi and Saoussen Krichen
11.20 - 11.40	Incorporating capacity economies-of-scale in supply chain network design
	Samir Elhedhli, Vedat Bayram and Fatma Gzara

	A5: Applications of Multiple Criteria Decision Aid 1 (Chair: Mohamed Ayman Boujelben)
	Caesar 4
10.20 - 10.40	MCDM integrated in GIS to evaluate land suitability for agriculture
	Mendas Abdelkader
10.40 - 11.00	Multi-criteria analysis as a tool of Decision Aid in the Management of Public Irrigated Areas: The case of SIDI BOUZID governorate
	Lobna Ben Harb, Imen Ajili and Talel Ladhari
11.00 - 11.20	Management Strategy Selection over Water Resources using The PROMETHEE method for Tlemcen region in Algeria
	Belaribi Belaribi and Benhabib Abderrezak
11.20 - 11.40	Combining the PROMETHEE method and mathematical programming for facility location problem/distribution network problem
	Mohamed Ali Elleuch and Ahmed Frikha
	A6: Metaheuristic for Decision Aid-1 (Chair: Olfa Dridi)
	Caesar 5
10.20 - 10.40	A genetic algorithm for the project portfolio using a SAT formulation
	Mohamed Slim Kassis, Giacomo Di Tollo and Hend Bouziri
10.40 - 11.00	Tabu Search metaheuristic for Job Shop scheduling Problem with Generic Time Lags
	Madiha Harrabi and Olfa Belkahla Driss
11.00 - 11.20	Mixed load school bus routing problem optimization with metaheuristics
	Najeh Ben Guedria and **Anouar Karmani**
11.20 - 11.40	A Multi-Objective Evolutionary Approach Solving The Assignment and Scheduling Problem
	Olfa Dridi, Saoussen Krichen and Adel Guitouni
	A7: Decision and Uncertainty (Chair: Meryem Masmoudi)
	Caesar 6
10.20 - 10.40	A Hybrid Uncertainty Multi Objective Decision Making Method: Stochastic Multi Choice Goal Programming
	Hocine Amine, Samir Bettahar and **Abdelbasset Benmaamar**
10.40 - 11.00	Solving a Green Service Network Problem under Uncertainty using a Simulation-based Optimization Approach
	Amel Jaoua, Yosra Makhlouf, Asma Jbira and Safa Bhar Layeb
11.00 - 11.20	Multiple Objective Portfolio Selection Models: Review of Deterministic and Stochastic Models
	Fouad Abdelaziz and **Meryem Masmoudi**
11.20 - 11.40	A Multiobjective Stochastic Model for Ambulance routing
	Fouad Ben Abdelaziz, **Houda Alaya** and Hatem Masri
	B1: Multiple Criteria Decision Aid (Chair: Taicir Loukil)
	Amphitheatre Caesar
11.40 - 12.00	TOPSIS methods and group decision makers: new extension
	Zhor Chergui and Moncef Abbas
12.00 - 12.20	Development of new distance and similarity measures between interactive criteria and their application to a GDM
	Sonia Hajlaoui, Nesrin Halouani and Habib Chabchoub
12.20 - 12.40	Ranking with PROMETHEE Method by using aggregation operators
	Roumeissa Kerboui and Moncef Abbas
12.40 - 13.00	Evaluation of MCDA methods: theoretical study & results
	Zhor Chergui and Moncef Abbas

	B2: Corporate governance 1 (Chair: Walid Saffar)
	Caesar 1
11.40 - 12.00	The control dilution of the initial controlling shareholder post-Initial Public Offering: Determinants and implications in the French context
	Rihab Kriaa and Taher Hamza
12.00 - 12.20	Product Market Predatory Threats and the Cost of Equity
	Sabri Boubaker, **Samir Saadi** and Syrine Sassi
12.20 - 12.40	Employee Well-being and Debt Maturity
	Sabri Boubaker, **Marwa Haddar** and Taher Hamza
12.40 - 13.00	Analyst following and the influence of board components and ownership
	Chiraz Ben Ali, **Ilyes Abid** and Imene Haouet
	B3: Decision Aid in Production Management (Chair: Mohamed Ayman Boujelben)
	Caesar 2
11.40 - 12.00	Dynamic international facility location under uncertainties: A review and insights
	Mouna Kchaou Boujelben and Youssef Boulaksil
12.00 - 12.20	Using System Approach and Decision Making in Production
	Mohamed Najeh Lakhoua, **Maroua Ben Hamouda**, Rami Mahmoudi, Khouloud Mellekh and Maroua Ben Hriz
12.20 - 12.40	SCADA System and Dependability Study for Helping in the Decision Making
	Maroua Ben Hamouda, Mohamed Najeh Lakhoua and Lilia El Amraoui
12.40 - 13.00	Carbon emissions, renewable and non-renewable electricity consumption, and economic growth: Assessing the evidence from Algeria
	F. Bélaïd and **Meriem Youssef**
	B4: Decision Making in Supply Chain Management 2 (Chair: Saoussen Krichen)
	Caesar 3
11.40 - 12.00	Channel Coordination with Quantity Discounts and/or Cooperative Advertising
	Salma Karray and Chirag Surti
12.00 - 12.20	Integration of fuzzy AHP-TOPSIS method for prioritizing the solutions of Knowledge Management adoption in Supply Chain to overcome its barriers
	Imen Belhajali and Younes Boujelbene
12.20 - 12.40	Application of Fuzzy ANP approach for prioritization of the partner selection criteria
	Souhir Ben Salah, Wafa Ben Yahia, Omar Ayadi and Faouzi Masmoudi
12.40 - 13.00	Impact of Multi-Behaviors Actors on the Performance of a Supply Chain based on Six Sigma Approach
	Tarak Barhoumi and Diala Dhouib Karray
	B5: Decision and Health sciences 1 (Chair: Rimeh El Fayedh)
	Caesar 4
11.40 - 12.00	A New Approach for Home Health Care Planning Problem
	Safa Bahri, Adnen El Amraoui and Sondes Hammami
12.00 - 12.20	Multi-Start Local Search for Nurse Rostering Problem
	Fatima Guessoum and Salim Haddadi
12.20 - 12.40	Modeling and Performance Evaluation of the offices in an institution of health coverage
	Khalfalli Marwa
12.40 - 13.00	Risk Assessment of Hospital Sterilisation Process Using FMECA Approach
	Amira Kammoun and Wafik Hachicha

	B6: Security and Routing Problems (Chair: Nabil El Kadhi)
	Caesar 5
11.40 - 12.00	A DSS based on a genetic algorithm for solving the hydrogen transportation problem
	Hiba Yahyaoui and **Saoussen Krichen**
12.00 - 12.20	Vehicular Cloud Computing for Tourism Services and Intelligent Traffic Control
	Mohamed Aissa, Hatem Masri and **Badia Bouhdid**
12.20 - 12.40	An Evolutionary based Semantic Annotator and an Effective Model for Semantic Information Retrieval Systems in Semantic Web
	Princess Maria John, Arockiasamy Soosaimanickam,Mohamed Aissa and **Badia Bouhdid**
12.40 - 13.00	Assessment of traffic congestion in arterial roads of Tunisian Metropolitan City
	Sana Ben Hassine, Rafaa Mraihi and Elyes Kooli
	B7: Financial Decision Making (Chair: Jocelyn Grira)
	Caesar 6
11.40 - 12.00	Equity Pricing in Islamic Banks: International Evidence
	Jocelyn Grira, M. Kabir Hassan, Chiraz Labidi and Issouf Soumaré
12.00 - 12.20	Portfolio selection strategy for Italian fixed income market
	Noureddine Kouaissah, Sergio Ortobelli and Tomas Tichy
12.20 - 12.40	A Multiple Criteria Approach for Working Capitals
	Yomna Abdulla and **Hatem Masri**
12.40 - 13.00	A Ratio-Behavioral explanation of subprime crisis: Multi Agent Systems modeling and simulation in Artificial Financial Markets
	Yosra Ben Said, **Dalel Kanzari** and Marwa Bezzine
13.00 - 14.00	**LUNCH**
15.00 - 15.40	**Keynote Speech 2**
	Sustaining Competitive Advantages through Effective Decision Making
	Hesham A.E. Magd
	Amphitheatre Caesar
15.40 - 16.00	**COFFEE BREAK**
	C1: Multiobjective Optimization (Chair: Taicir Loukil)
	Amphitheatre Caesar
16.00 - 16.20	The robust bi-objectif fractional programming problem
	Asma Cheikh
16.20 - 16.40	Optimizing a linear fractional function over the integer efficient set
	Wassila Drici, **Mustapha Moulaï** and Fatma Zohra Ouail
16.40 - 17.00	System survivability under poisson attacks: A game theoretic setting with single and multiple objectives
	Asma Ben Yaghlane and **M. Naceur Azaiez**
17.00 - 17.20	Bi-objective modeling of multi-item capacitated lot-sizing problem
	Hanen Ben Ammar, Omar Ayadi and Faouzi Masmoudi

	C2: Financial markets 2 (Chair: Taher Hamza)
	Caesar 1
16.00 - 16.20	Les déterminants institutionnels et macroéconomiques du développement du marché boursier dans les pays de la région MENA
	Ibtissem Missaoui and Jaleleddine Ben Rejeb
16.20 - 16.40	KOU JUMP diffusion model: An application to the SP 500; NASDAQ 100 and RUSSELL 2000 index options
	Wajih Abbassi
16.40 - 17.00	Implementing the Mixture of Factor Analyzers In the financial context: Tunisian Exchange rate risk Measurement using VaR.
	Mohamed Saidane, Mohamed Nidhal Mosbahi and **Sarra Messabeb**
17.00 - 17.20	L'impact de la révolution Printemps Arabe sur le marché boursier: Validation empirique sur la Tunisie
	Atri Hanen, Belghith Feriel et Chkir Imed
	C3: Decision and IT (Chair: Hesham A.E. Magd)
	Caesar 2
16.00 - 16.20	Design of a telecommunication ring access network
	Ali Balma and Mehdi Mrad
16.20 - 16.40	Optimization and Evaluation of Voice Quality in VoIP
	Said Ouznadji and Djamel Chaabane
16.40 - 17.00	The Challenge of integrating Workflow Technology in Quality management Practice: Customer Complaints Management as a Case
	Zied Ben Rhouma and Younes Boujelbène
17.00 - 17.20	A Decision Aid System for Omani medical herb leaves recognition using computer vision and artificial intelligence
	Majed Bouchahma, Mohsin Jan Al Balushi, Sheikha Nasser Khalaf Al-Housni and Hamood Al-Wardi
	C4: Decision Models in Human Resource Management and Marketing (Chair: Volker G. Kuppelwieser)
	Caesar 3
16.00 - 16.20	Une nouvelle approche de résolution du problème d'affectation sous contraintes des compétences et des préférences
	Souidi Lamjed
16.20 - 16.40	The Crowdfunding: Analyses of the impacts of the determinants of motivation contributors to fund projects on Crowdfunding platforms
	Imen Abdennadher Gdoura and Abdellatif Tarek
16.40 - 17.00	Embodied Virtual Agents (EVA): Why are they not more numerous?
	Mohamed Slim Ben Mimoun, Ingrid Poncin and Marion Garnier
17.00 - 17.20	A multi-SOM application for Market Segmentation
	Imen Khanchouch, Malika Charrad and Mohamed Limam
	C5: Decision and Fuzziness (Chair: Olfa Meddeb)
	Caesar 4
16.00 - 16.20	Extension of the hesitant fuzzy linguistic term sets
	Nesrin Halouani
16.20 - 16.40	Hesitant Fuzzy Reliable Quality Function Deployment
	Sawsen Maalej, Nesrine Halouani and Habib Chabchoub
16.40 - 17.00	Decision risk analysis through fuzzy multi-segment programming
	Hocine Amine, Samir Bettahar and **Abdelbasset Benmaamar**
17.00 - 17.20	Interrelationships among manipulabilities of fuzzy social choice functions
	Olfa Meddeb, Fouad Abdelaziz and Jose Rui Figueira

	C6: Scheduling Problem Decisions 1 (Chair: Imed Kacem)
	Caesar 5
16.00 - 16.20	A Greedy Chemical Reaction Optimization for Flexible Job Shop Scheduling Problem
	Bilel Marzouki and Olfa Belkahla Driss
16.20 - 16.40	A Bio Inspired Algorithm For Solving Distributed Job Shop Scheduling Problems In Muli-Factories
	Imen Chaouch, Olfa Belkahla Driss and Khaled Ghedira
16.40 - 17.00	Scheduling for a reconfigurable manufacturing systems
	Chiraz Bettaieb, Achraf Jabeur Telmoudi and Lotfi Nabli
17.00 - 17.20	Flexible Job shop problem with sequence-dependent setup time and learning effects
	Ameni Azzouz, Meriem Ennigrou and Lamjed Ben Said
17.20 - 17.40	A PTAS for the Maximum Lateness Open Shop Problem on a Fixed Number of Machines
	Imed Kacem and Christophe Rapine
	C7: Corporate governance 2 (Chair: Samir Saadi)
	Caesar 6
16.00 - 16.20	Role of Banks in The Governance of Non-Financial Firms: Evidence from Europe
	Ahmed Zemzem, Sameh Mekaoui and **Khaoula Ftouhi**
16.20 - 16.40	Intellectual capital disclosures and corporate governance: An empirical study of non-family vs. family firms in France
	Adel Beldi, Salma Damak-Ayadi and **Walid Cheffi**
16.40 - 17.00	CSR disclosure and country-level institutional differences: an international comparative analysis
	Zeineb Miniaoui and Khamoussi Halioui
17.00 - 17.20	Determinants of Agency Costs of Equity: new evidence from French context
	Mondher Kouki and Moez Dabboussi
20.00 - 22.30	**CONFERENCE DINNER**
WEDNESDAY 20/07/2016	
8.20 - 9.00	**Conference Registration**
	D1: Applications of Multiple Criteria Decision Aid 2 (Chair: Sihem Ben Abdallah)
	Amphitheatre Caesar
9.00 - 9.20	A new hybrid approach for multi-criteria inventory classification using Differential Evolution and Topsis
	Mohamed Hedi Cherif and Talel Ladhari
9.20 - 9.40	The Analytic Hierarchy Process: a multicriteria classification method in the medical decision making
	Manel Zribi and Younes Boujelbene
9.40 - 10.00	Multi-criteria approach for the performance evaluation of industrial purchase: the case of a company of Furniture Manufacture
	Saoussen Ben Ammar and Taicir Moalla Loukil
10.00 - 10.20	New hybrid linear programming models using both quantitative and qualitative criteria for ABC Multi-Criteria Inventory Classification
	Hadhami Kaabi and Khaled Jabeur

	D2: Corporate Finance (Chair: Sabri Boubaker)
	Caesar 1
9.00 - 9.20	Effectuation: Impact on R&D project Performance within Innovation
	Lazreg Chaima and Lassaad Lakhal
9.20 - 9.40	Earnings Management Decision Based on Game Theory
	Saad Bourouis
9.40 - 10.00	The effect Financial Reporting Quality on Corporate Investment Efficiency:Evidence from the Tunisian Stock Market
	Asma Houcine Masrouki and Mohamed Chakib Kolsi
10.00 - 10.20	The Modigliani-Miller Capital Structure Irrelevance Theorem with less restrictive assumptions
	Mondher Kouki
	D3: Statistical Decision Making and Statistical Analysis (Chair: Mohamed Limam)
	Caesar 2
9.00 - 9.20	A Review and perspectives on Control charting with 3D scanned data
	Houyem Demni, Asma Abdaoui and Amor Messaoud
9.20 - 9.40	A Control Chart For Monitoring Image Data and Providing Both Spatial and Temporal Diagnostic Information
	Asma Abdaoui, Houyem Demni and Amor Messaoud
9.40 - 10.00	ANOVA and Regression as Powerful Tools in Engineering: Some Practical Examples
	Ahmad Jamrah and Osama Marzouk
10.00 - 10.20	Sales forecasting and coal mining planning in the context of hard coal production strategies
	Aurelia Rybak and Anna Manowska
	D4: Metaheuristic for Decision Aid-2 (Chair: Hela Masri)
	Caesar 3
9.00 - 9.20	Simulated Annealing for the Uncapacitated Exam Scheduling Problem
	Meryem Cheraitia and Salim Haddadi
9.20 - 9.40	Towards fair rosters' construction: proposed meta-heuristics for solving the aircrew rostering problem
	Chaima Boufaied, **Hela Masri** and Saoussen Krichen
9.40 - 10.00	A Genetic Algorithm Based Decision Support System for the Petrol Station Replenishment Problem
	Islem Kaabachi and Saoussen Krichen
10.00 - 10.20	A hybrid Metaheuristic Approach for the Multi-Objective Heterogeneous Node Placement Problem
	Ons Abdelkhalek, Saoussen Krichen and Adel Guitouni
	D5: Scheduling Problem Decisions 2 (Chair: Mohamed Naceur Azaiez)
	Caesar 4
9.00 - 9.20	Hierarchical modeling and solving approach for the Home Health Care Scheduling Problem
	Marouene Chaieb, Jaber Jemai and Khaled Mellouli
9.20 - 9.40	The Variable neighborhood search for the job shop scheduling problem
	Imen Bouzaya
9.40 - 10.00	Decision Support System for the Open-Shop Scheduling problem
	Olfa Harrabi, Jouhaina Siala Chaouachi and Hend Bouziri
10.00 - 10.20	A multi-attribute utility based classification for law-project-dynamic scheduling at the Tunisian Parliament
	Sonia Rebai and Mohamed Naceur Azaiez

	D6: Decision Aid in Accounting and Auditing (Chair: Halioui Khamoussi)
	Caesar 5
9.00 - 9.20	Principal agent model of Earnings and Tax management relationship
	Neifar Souhir, Ben Abdelaziz Fouad and Halioui Khamoussi
9.20 - 9.40	Cultural Tightness-Looseness and Fraud Acceptance
	Haithem Zourrig
9.40 - 10.00	Psychological Reactance in the auditee's behaviors
	Riadh Manita, Abir Sakka and Najoua Elommal
10.00 - 10.20	The Effects of Mandatory IFRS Adoption and Audit Quality on Accounting Quality in Europe: Conditional Conservatism
	Manel Ben Arab and Younes Boujelbene
	D7: Corporate governance 3 (Chair: Anis Jarboui)
	Caesar 6
9.00 - 9.20	Pouvoir du dirigeant, attributs du conseil d'administration et profil de risque à long terme de l'acquéreur: Cas du secteur bancaire en Europe
	Sghaier Adnène and Hamza Taher
9.20 - 9.40	CEO Inside Debt and Labor Investment Efficiency
	Sabri Boubaker and **Kaouther Chebbi**
9.40 - 10.00	Relation gouvernance-innovation et son impact sur la performance des PME
	Rihab Hentati and Younes Boujelbene
10.00 - 10.20	The study of relationships between ownership structure and voluntary disclosure in Tunisian Stock Exchange
	Anis Houidi and Anis Jarboui
10.20 - 10.40	**COFFEE BREAK**
10.40 - 11.40	**Roundtable**
	Combining local impact and global relevance to make impactful decisions
	Karim Seghir
	Amphitheatre Caesar
11.40 - 12.00	**Awards Ceremony**
	Amphitheatre Caesar
12.00 - 12.20	**Closing Ceremony**
	Amphitheatre Caesar
12.20 - 14.00	**LUNCH**

8. Doctoral Workshops

The Impacts of Transport Decision Systems on Public Health: Issues and Challenges

Ghassan Abu-Lebdeh, American University of Sharjah, UAE

The impacts of transport systems on human health are serious and far-reaching yet they are typically overlooked except for the obvious infringement on safety. This presentation describes the scope of the impacts transport systems have on public health, explains their significance and approximate magnitude, and highlights the many issues and decisions involved in modeling and quantifying those impacts. It is shown that the complex, large, open and integrated nature of transport systems makes the capturing of health impacts and the incorporation of those impacts in the decision-making process imperative, yet that poses numerous challenges. Those pertain to the basic notion and definition of health/healthy, the separation between causality and correlation when identifying specific health issues, the type of metrics necessary to capture the varying and often interrelated health outcomes, and the fact that there are multiple determinants of health. A framework is proposed to help understand and model the health impacts of transport systems. A case study is presented where driver "stress" is modeled and integrated in the design of signalized traffic control.

Approximation Techniques for Hard Cobinatorial Optimization Problems

Imed Kacem, LCOMS, Université de Lorraine (France)

This talk will focus on the design and the power of approximation algorithms to solve hard combinatorial problems. In particular, we will be interested in the worst-case analysis of heuristics and in the elaboration of approximation schemes. More precisely, we will introduce the differences of the approximation levels: constant approximations, polynomial time approximation schemes (PTAS) and fully polynomial time approximation schemes (FPTAS).

As illustration, we will present several algorithms for solving hard problems such as the bin-packing, the scheduling and the maintenance optimization problems.

Decision Aid Sciences in Information Technology: A Success Factor or a Challenge

Nabil EL KADHI, University of Buraimi, Sultanate of Oman

Information Technologies and Computer Science Applications are today more than a success factor for any corporate. They are the heart and center of any economic activity and they appear today as a basic necessary component in mankind daily-life activities. Many factors contributed to such paradigm shift from a luxury tool to a vital component such as Hardware Development, Connectivity and Democratization of the Net.

The previously mentioned elements are only the visible part of the iceberg and cannot be considered alone as the 'success factor' of the Information Technology techniques. In fact since Turing Test and Turing Machine applications, the Gold Dream used to be managing to mimic human behavior, thinking skills and decision abilities to a level that an observer cannot distinguish a Machine Behavior from a Human Behavior. Pursuing such target and continuously aiming to successfully imitate human behaviors in all sectors was the engine for analyzing the key process of all mankind activities – Taking Decisions. How and where Decision Aid Algorithm is used in Information System and Information Technologies applications? How does it contribute to the efficiency and the transformation of IT and IS from complementary to compulsory components? We will together explore various areas of applications and identify the success factors, played by DAS in IT and IS applications.

Similarly, IT and IS Automated or partially automated applications contributed to the development of DAS. In fact tackling new applications and new area raised additional challenges and constraints that the DAS has had to take in consideration and answer to. Among the challenges emphasized by IT applications are - Convergence, Completeness, Complexity, Termination, Non-determinism and incomplete Data-based Decision-making. Hence DAS applications in IT, poses the question - is it a success factor or a challenge? Is DAS contributing to the IT development or is it a bi-directional amazing dependency? - An open question that we will be exploring through variety of cases and applications.

9. Keynote Speeches

Open and Current Research Questions in Marketing – a Chance for Decision Science Researchers to Step in?

Volker G. Kuppelwieser, NEOMA Business School, France

This plenary session focuses on developments and trends in the Marketing field. While marketing's perspective is slowly changing and adapting to upcoming problems, the decision making research field is continuously seeking for applications. Both literature streams seem quite unconnected, but have fruitful avenues for research.

This talk touches several raising issues and opens research opportunities in the marketing field. The

session also briefly describes current and mainstream methodological approaches in marketing. At the end of the talk, participants are welcome for a Q&A session to explore research in this area.

Sustaining Competitive Advantages through Effective Decision Making

Hesham A.E. Magd, University of Buraimi, Sultanate of Oman

In today's fast-changing context, practically every organisations aim to thrive rather than just survive. It is with no doubt that the competitive environment is rapidly changing across most continents. Technology, globalisation and customer preference are all driving the need for speed, customisation and higher-value products and services. Researchers have highlighted some of the challenges that are specific to industry context such as time, results, stakeholders, funding, technology, demographic scope and many others. Against these competitive backdrops, one of the observable key factors in sustaining competitive advantage is the effectiveness of decision making in any organization. It is in this sense that this study focuses on the involvement of both managerial and operational employees in decision-making processes. On the other hand, this study sets out to explore the critical success factors to execute effective decision making. Moreover, it highlights the importance of participation and diversity in decision making teams and its potential impact on effective decision making in organizations. Ultimately, several positive outcomes could emerge from employee engagement in decision making which may lead to an overall sustainable high performance for an organization. Although there is no single blueprint for sustainable effective decision making that discriminate among industries and organizations, certain patterns of successful critical factors in decision making are detectable and may prove useful for organizations. Thus, understanding these by using evidence based on experience could be beneficial to policy makers and researchers.

10. List of Abstracts

The Analysis of Energy Efficiency of Mediterranean Countries: A Two Stage Double Bootstrap DEA Approach

Session Title: *Investment and Efficiency*

Abstract: The purpose of this study is to examine energy efficiency and its determinants in Mediterranean countries during the period 2009-2012. We conduct a two stage analysis using the Simar and Wilson's double bootstrap procedure which allows a valid inference in the presence of unknown

serial correlation in the efficiency scores. First we evaluate DEA scores and then we regress them on potential covariates in order to determine factors affecting energy efficiency. The emprical results from first stage indicate that Malta and Italy perform the best in energy efficicency. In addition regression results show that the gross national income per capita, the density and the renewable energy use affect energy efficiency of Mediterranean countries.

Keywords: Energy Efficiency, Data Envelopment Analysis(DEA), Double Bootstrap, Mediterranean countries

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Assessing the efficiency of Tunisian schools: A data envelopment analysis approach with non-discretionary inputs and undesirable outputs

Session Title: *Investment and Efficiency*

Abstract: The purpose of this study is to measure the efficiency of Tunisian schools. The data is proved from PISA 2012 survey. We use the directional distance function methodology to deal with undesirable outputs (Student leaving the school without certificate) and non-discretionary inputs (quality of physicals' infrastructure, quality of school educational resources). We use Data Envelopment Analysis (DEA) methods to estimate the model. We show that 55% of schools are efficient and on average and as a conservative estimate, Tunisian schools could have increased their results by 6% using the same resources.

Keywords: Educational Economics, Efficiency, Data Envelopment Analysis, Undesirable outputs, Non-discretionary inputs

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Ethical investment performance: Evidence from the portfolio theory perspective

Session Title: *Investment and Efficiency*

Abstract: In this paper, we explore and examine the performance of socially responsible investments (SRI), frequently called ethical investments or sustainable investments, from the portfolio theory perspective. In particular, we investigate and compare the returns of SRI funds/indices and conventional investments. By applying the portfolio optimization method to different ethical funds/indices, we are able to answer several questions that arise with ethical investments opportunities. Thus, we first start from Italian ethical market (funds/ indices) and then we strengthen our analysis on ethical investing to international market using MSCI KLD 400 social index. In essence, we propose empirical analysis of several admissible portfolio optimization problem using Italian and international ethical investments funds/indices. The proposed empirical analysis allows us understanding the dynamics of the ethical investments and evaluating their performance. The results reveal the complexity SRI investors face in finding ethical investments that meet their non-financial goals. The preliminary results from Italian market are in contrast with the corporate social responsibility (CSR) theory conclusion, which confirms that ethical investments are performing much better than its traditional counterparts. This may well be linked to the characteristics and peculiarity of Italian market, recentness and dimensionality of Italian funds/indices. International indices, on the other hand, appear to be best performing and in line with the CSR theory.

Keywords: Ethical investing, SRI, portfolio optimization, CSR theory

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Technical efficiency of socially responsible mutual funds in Canada

Session Title: *Investment and Efficiency*

Abstract: In this paper, we propose to measure the performance of socially responsible mutual funds in Canada, then to compare them to conventional mutual funds. Our empirical analysis has determined that there is no significant difference regarding the overall technical efficiency and scale efficiency between socially responsible mutual funds and traditional mutual funds, while for the pure technical efficiency there is a statistically significant difference, indicating that socially responsible mutual funds are better managed than conventional mutual funds.

Keywords: socially responsible mutual funds, conventional mutual funds technical, efficiency DEA Canada

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Measuring of international financial integration with a multicriteria decision aid approach

Session Title: *Financial markets 1*

Abstract: Despite the diversity of advanced approaches, the concept of “financial integration” couldn’t be an explicitly analysed. Indeed, empirical studies have showen that the measures of international financial integration are one-dimensional analysis. Due the ambiguity of the concept and its multiple determinants, it must be analyzed in multidimensional levels. The interest of this research is a proposal of a decision aid by multicriteria approach (ELECTRE TRI) for determining the ranking of 47 countries according to their degree of international and financial dependencies links with the behavior of financial actors (trying to make governance decisions or diversification strategies of international portfolio ...

Keywords: finacial integration, multicriteria approach, decision

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Multi agent systems for modeling information game in financial market

Session Title: *Financial markets 1*

Abstract: In this paper, we propose a multi agent based approach to model the complexity of financial market. Previous simulated models addressed the buying and purchasing assets and didn't investigate at the same time the information exchange process. We simulate an artificial marketplace with interacting and heterogeneous agents where they exchange information and assets at the same time. Our model is able to better describe the market behaviour.

Our simulator is implemented using JAVA programming language and JADE developing multi-agent framework.

Keywords: artificial financial market, multi agent system, intelligent agents, transaction exchange, the value of information exchange

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Preliminary Study on Stakeholders' Needs and Requirements to Improve Maintenance Performances

Session Title: *Financial markets 1*

Abstract: In this paper, a two-stage approach to improve maintenance performance is proposed. Firstly We identify relationship between functioning of an industrial machine and motivation or competence of operators. Secondly requirements and recommendations of every stakeholder to improve the maintenance performance in a complex system are harvested based on semi-structured interviews with different stakeholder of maintenance plan. Our approach constitutes a reference framework and therefore valuable elements supporting decision maker in his decision making process.

Keywords: Maintenance performance, Semi structured interviews, Decision Making

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On the Instability of Tunisian Money Demand

Session Title: *Financial markets 1*

Abstract: This paper focuses on the causes of instability of money demand in Tunisia between 1973 and 2013. It has been argued that the main explanatory factors of money demand are national income, monetary market rate and exchange rate. We tested the Amble and McKinnon's hypothesis (1985) which assumes that instability is explained by the absence of the nominal exchange rate in the specification of money demand. We found that structural changes are explained by the dependence of the national economy to world shocks, the IMF's structural adjustment program in the end of 1986.

Keywords: Money demand, Structural change tests, Causality tests, Stability tests

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Enabling Accurate Travel Time Prediction on Urban Interrupted Flow Facilities with Neural Networks Using Conventional Data

Session Title: *Decision and logistics*

Abstract: Controlling traffic and managing congestion to reduce delay, emissions and energy consumption in urban transport networks is at the heart of creating sustainable transport systems. An integral enabler of traffic routing, managing congestion and creating smoother traffic flow is the ability to predict travel time on interrupted flow facilities into the future so that active control and routing of traffic can be optimally planned and implemented. This paper presents a model where conditional independence (CI) graphs and state space neural networks (SSNN) are used to predict travel time along signalized arterials with limited traffic data. No additional specialized instrumentation is assumed.

Keywords: Travel Time Prediction, Signalised Traffic Networks, Neural Networks, Conditional Independence Graph

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An Optimization-Based Decision Support For Urban Transportation Planning In Grand Tunis

Session Title: *Decision and logistics*

Abstract: Transportation engineering and transportation planning are two sides of the same coin aiming at the design of an efficient infrastructure and service to meet our needs for accessibility and mobility. Many well-designed transport systems that meet these needs are based on a good decision making process.

The urban transportation system is the engine of economic activities in all urban communities all over the world. Furthermore, The quality of public transportation services has one of the most important performance indicators of modern urban policies for both planning and implementation aspects.

In this short paper, we are concerned with the public mass transit especially the urban bus in the Tunisian case, to implement a transportation improvement plan (TIPs) and to optimize the urban traffic within a few years . Planning transportation is a decision making process. This decision-making is related to some sections and is addressed to plan movements of the public bus which includes the optimal number of buses, stops, length of lines required etc.

Keywords: Transport planning, Decision making process, urban transportation system, Bus routing problem, Tunisian case

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Interest of the multidimensional analysis to evaluate the quality of service of urban public transport

Session Title: *Decision and logistics*

Abstract: This paper embodies, initially, the importance of public transport and in a specific way urban public transport. Secondly, we analyzed various evaluation methods of the quality of the service of transport. Finally, the framework thus presented then illustrated and is enriched by case studies from the various countries. According to this study, we tried to measure the degree of satisfaction of the users of the bus with an aim of evaluating the quality of service of urban public transport in greater Sfax by the setting-up of a questionnaire for a sample of hundred people. Using software SPSS, we carried out a multidimensional analysis by using a factorial analysis by the principal components, a correspondences analysis factorial and a discriminating factorial analysis through various criteria relating to the service ensured by the regional company of transport of Sfax and we released, following the results interpreters the variables which influence on the quality of the service. While basing oneself on various methods of analysis, we can conclude that the quality of bus transport is average with 64% of customers are satisfied. Also, we can confirm that the timeliness and accessibility of the bus are the most important criteria to improve customer satisfaction.

Keywords: urban public transport, analyze multidimensional, the quality of the service, the regional company of transport of Sfax

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The household management problem: A literature review

Session Title: *Decision and logistics*

Abstract: Several researchers have considered the Green Logistics (GL).The GL approach aims to reduce the environmental impact of a product through its life cycle. Various green activities and operations can be modeled as combinatorial optimization problems. In this paper, we focus on Household Waste Management problem (HWM). This problem is divided in four steps: collection, keeping, treatment and disposal of waste. The aim is to render these operations harmless to human and animal life and to the environment in general. The HWM can be formulated as a multiple objectives problem. This paper presents four objectives functions which are; economic, technical, and environmental and the

conservation of resources. We classify the mathematical formulations of HWM into certain, uncertain and dynamic models. This paper provides an overview of scientific researches on HWM with multiple objectives.

Keywords: Household Waste Management Problem, multiple objective programming, certain models Uncertain and Dynamic models

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IDENTIFYING OF THE SUPPLY CHAIN PERFORMANCE FACTORS

Session Title: *Decision Making in Supply Chain Management 1*

Abstract: Objective/ Goal

The objective of this article is to identify and prioritize the performance factors of the supply chain.

Design / Methodology / Approach

In this article, different performance factors of the supply chain are identified from literature review. Two statistical approaches are used to analyze and prioritize the supply chain performance factors: "Data Analysis" and method "AHP" Analytic Hierarchy Process".

Result

• Analyze the different factors and specify the most impact on business performance through the adoption of Data Analysis.

• Priority and hierarchy the supply chain performance factors by using AHP method.

Originality / value:

The value of this paper is based on three points: the design of a performance model of the supply chain, identification and prioritization of factors by two statistical methods which are AD and AHP.

Keywords: Supply chain, Factors, Performance, Analytic Hierarchy Process, Principal Component , Analysis, Linear regression

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Risk management in petroleum supply chain : A review

Session Title: *Decision Making in Supply Chain Management 1*

Abstract: The petroleum supply chain is extremely inflexible and complex. It appears as a signifiant risk and a high impact at the national economic. The complexity leads to the existence of different types of risk that need to be accounted for when designing planning and operating such systems.

The aim of this paper is to present a literature review on the management of risk in petroleum supply chain. First, we review a main risk related to such operation of petroleum supply chain. Then, we present an overview of the modelling techniques of the risk management.

In the results of this work, we show that a type of risk depend on such operation of supply chain and depend on country (importer or exporter). Also, we conclude that we can organize the methodologies of the risk management in two types the qualitative and the quantitative model.

Keywords: petroleum supply chain, risk, qualitative, quantitative, literature Review

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Bi-level Optimization of the Supply Chain of Oil in Smart Cities

Session Title: *Decision Making in Supply Chain Management 1*

Abstract: Smart Cities are urban environments where geospatial data is accurately and comprehensively captured in real-time. Drawing on this wealth of data opens up a series of new marketing and customer service opportunities in retail and logistics. Supply chain management in the petroleum industry contains various challenges, specifically in the logistics area, that are not present in most other industries. These logistical challenges are a major influence on the cost of oil and its derivatives.

However, opportunities for cost savings in logistics still do exist especially with the widespread use of sensor technology in Smart Cities.

In this study, a mathematical model is proposed to minimize the cost of the entire supply chain of oil from refinery to final consumers, while satisfying demand and resource.

We developed a solution method based on a genetic algorithm approach that takes into account the characteristics of the specific problem. At the first level we optimize the distribution of refined oil from refinery to Oil depot. Thus, at the second level we optimize the distribution of refined oil from oil depot to gas station through wholesale. The minimization of the transportation costs is tackled which is successfully tested in this paper. A mathematical model of the problem is developed, and results on a wide variety of instances and comparisons with other works found in the literature are presented to illustrate the effectiveness of our algorithm in solving the oil supply chain problem.

Keywords: Supply chain management, Smart cities, Gas stations, Genetic algorithms

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Incorporating capacity economies-of-scale in supply chain network design

Session Title: *Decision Making in Supply Chain Management 1*

Abstract: We study a class of supply chain network design problems facing stochastic demand and enjoying economies-of-scale. We consider the capacity, inventory and demand allocation decisions faced by a manufacturing firm with a single large production facility, multiple distribution centers, and multiple demand zones facing stochastic demand. This leads to nonlinear optimization models with concave and convex terms in the objective that are challenging to solve. We provide new formulations and solution approaches, carry out numerical testing and provide managerial insights.

Keywords: Supply chain network design, economies of scale, concave and convex optimization

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MCDM integrated in GIS to evaluate land suitability for agriculture

Session Title: *Applications of Multiple Criteria Decision Aid 1*

Abstract: The integration of MultiCriteria Decision Making (MCDM) approaches in a Geographical Information System (GIS) provides a powerful spatial decision support system which offers the opportunity to efficiently produce the land suitability maps for agriculture. Indeed, GIS is a powerful tool for analyzing spatial data and establishing a process for decision support. Because of their spatial aggregation functions, MCDM methods can facilitate decision making in situations where several solutions are available, various criteria have to be taken into account and decision-makers are in conflict. The parameters and the classification system used in this work are inspired from the FAO (Food and Agriculture Organization) approach dedicated to a sustainable agriculture. A spatial decision support system has been developed for establishing the land suitability map for agriculture. It incorporates the multicriteria analysis method ELECTRE Tri (ELimitation Et Choix Traduisant la REalité) in a GIS within the GIS program package environment. The main purpose of this research is to propose a conceptual and methodological framework for the combination of GIS and multicriteria methods in a single coherent system that takes into account the whole process from the acquisition of spatially referenced data to decision-making. In this context, a spatial decision support system for developing land suitability maps for agriculture has been developed. The algorithm of ELECTRE Tri is incorporated into a GIS environment and added to the other analysis functions of GIS. This approach has been tested on an area in Algeria. A land suitability map for durum wheat has been produced. Through the obtained results, it appears that ELECTRE Tri method, integrated into a GIS, is better suited to the problem of land suitability for agriculture. The coherence of the obtained maps confirms the system effectiveness.

Keywords: MultiCriteria Decision Analysis, Decision support system, Geographical Information System, Land suitability for agriculture

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Multi-criteria analysis as a tool of Decision Aid in the Management of Public Irrigated Areas: The case of SIDI BOUZID governorate

Session Title: *Applications of Multiple Criteria Decision Aid 1*

Abstract: In Tunisia, the contribution of the sub-sector of irrigated agriculture to Gross Domestic Product is estimated on average between 30% and 35%. Over the years, the government has implemented various programs to raise the sector's economic performance and achieve a high competitiveness level. However, until the present time, the sector has not generated the expected agricultural output. Today, irrigated areas reached 450,000 hectares; they are arranged in the form of public irrigated perimeters (PIPs) and private perimeters. In this study we focus on the PIPs, in which, farmers use water resources provided by the state, they share a common resource and entrust the management of the irrigation system to collective interest groups. Faced with the remarkable diversity that characterizes PIPs and given the importance of their weight in agriculture, we felt the need to review existing inventories on such perimeters, mainly that they represent more than half of the irrigated areas of the country. They are very heterogeneous and dispose of very different characteristics.

Based on these observations, the typology of irrigated areas thus remains a very central issue because it allows us to better interpret and validate performance indicators, of which irrigation systems, to clarify decision-making and planning.

The evaluation of agricultural policies was often a topic of application of multi-criteria approaches. In the literature, devising a typology of perimeters has attracted the interest of researchers and typology models that have been tried are numerous. They served economists and business managers as a tool for analyzing farmer's behaviour. Among these adapted typological tests we found typologies based on size, those based on land (Sakthivadivel & al., 2010) or those based on production. Despite being operational and easy to use, these typologies typically incorporate a limited number of criteria and have been criticized because they do not take into account the complexity of reality. Moreover, to devise typologies, the analytical methods that are the most widely used are the multidimensional and the multivariate methods such as Principal Component Analysis and Hierarchical Clustering Analysis.

To overcome these limitations, we propose in our study a new methodology to derive the typology of irrigated perimeters. Our solution is based on the idea of categorizing perimeters involving multiple criteria related to various aspects of farming and takes into account the relational and functional dimensions of the various components of these 2 perimeters. We therefore propose to apply linear and

nonlinear weighted optimization models used to perform ABC classification in the field of agriculture in order to classify public irrigated perimeters. The studied multi-criteria models are mainly: the R model, the Ng model, the ZF model, the Peer model and the H model respectively proposed by Ramanathan (2006), Ng (2007), Zhou & Fan (2007), Chen (2011) and Hadi-Vencheh (2010). Each of these models offers a different method to aggregate the performance of an inventory item in terms of multiple-criteria into a single score.

We mainly seek to identify groups of relatively homogeneous perimeters in SIDI BOUZID Governorate. Our choice is motivated by the expansion of irrigated agriculture in the area as well as the scarcity of its resources. We primarily seek to identify groups of relatively homogeneous perimeters in the SIDI BOUZID governorate. Therefore, the classification of PIPs according to areas allocated to four types of crops (cereals, vegetables, tree crops and fodder) using linear and nonlinear weighted optimization models constitutes the topic of our study. A final classification was obtained by applying a Constructive Order Classification Algorithm denoted COCA (Ladhari & al., 2015).

The contribution of this study is the classification of PIPs in the SIDI BOUZID governorate according to areas allocated to four types of culture and using weighted linear and nonlinear optimization models. In light of all the results, we obtained three types of perimeters: Class A perimeters opting for diversification strategies; class B perimeters of modest means and finally class C perimeters applying a mono-culture system and most of which are out of business. The analysis revealed also that most PIPs of SIDI BOUZID are class-C perimeters and monoculture-oriented, hence the potential is largely untapped, they suffer from several difficulties hindering their development and deserve special attention from the relevant policy-makers.

By reference to our results, and in order to help decision makers to propose regulatory measures and to develop agricultural policies, we formulate proposals and recommendations for the region of SIDI BOUZID. Thus, the multi-criteria analysis used allowed us to analyse and interpret the results to provide a useful and simple tool for decision making in the management of public irrigated perimeters.

Keywords: ABC classification, multi-criteria analysis, decision making

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Management Strategy Selection over Water Resources using The PROMETHEE method for Tlemcen region in Algeria

Session Title: *Applications of Multiple Criteria Decision Aid 1*

Abstract: Decisions about water resource management are complex in nature, since they involve consequences of environmental, social and economic impacts on society. Furthermore, the criteria used to determine these consequences are often contradictory and not equally important. However, the use of traditional methods became inappropriate because of their reliance on a single criterion in its analysis.

A new ranking approach using PROMETHEE (Preference Ranking Organization METHod for Enrichment Evaluation) is applied to a Multiple Criteria Decision Making (MCDM) problem. This paper describes the application of the PROMETHEE II and PROMETHEE-GAIA to evaluate and select development strategies from a variety of potentially feasible water resources. The PROMETHEE method was selected due to its simplicity and its capacity to approximate the way that human mind expresses and synthesizes preferences when facing multiple contradictory decision perspectives.

In this case study, the evaluation of the resource water management strategies is applied to Tlemcen Region in Algeria. The constitution of a set of alternatives strategies, the selection of a list of relevant criteria to evaluate these strategies and the choice of an appropriate management system are also analyzed in this framework. An inherent advantage of this approach is its ability to comprehensively consider quantitative and qualitative factors, making reliable decisions in an environment of uncertainty and subjective information. Also, the application of the MCDM methods shows that multi-criteria optimization can significantly facilitate and accelerate the decision-making process.

Keywords: Water resources management, Multicriteria analysis, decision making, PROMETHEE, Tlemcen.

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Combining the PROMETHEE method and mathematical programming for facility location problem/distribution network problem

Session Title: *Applications of Multiple Criteria Decision Aid 1*

Abstract: This paper proposes integrated multi-criteria facility location, production, and distribution planning for the supply chain network design which focuses on selecting the appropriate locations to build a new plant and distribution center while deciding the production and distribution of the product. We examine a multi-echelon supply chain that includes locations and distribution centers and develop a mathematical model that aims at optimizing many criteria of the supply chain. So, in terms of modeling, we integrate various operational features that were considered separately in the literature, but they have never been combined in the same model. Besides, we propose using the multiple criteria decision analysis (PROMETHEE) and a mathematical programming methodology to make network design decisions. In addition, the use of a mathematical programming combined with PROMETHEE will allow reducing the number of the alternatives and evaluating them according to real quantitative or qualitative decision criteria. In fact, this model is used to identify the best solution taking into account the criteria fixed by the decision maker and the data provisions generated by the mathematical programming.

Keywords: Multiple criteria decision analysis, PROMETHEE, Mathematical programming, Facility location problem, Distribution network problem

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A genetic algorithm for the project portfolio using a SAT formulation

Session Title: *Metaheuristic for Decision Aid-1*

Abstract: In our study, we use a steady state evolutionary algorithm to solve the satisability problem (SAT). We modelise the project portfolio selection in conjunctive normal form (CNF).For experimental purposes, we use an evolutionary algorithm GASAT that solves the canonical problem of satisfaction in propositional logic (SAT).

Keywords: Project portfolio selection, The satisability problem (SAT), Evolutionary algorithm, dynamic control strategies, Parameters tuning

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Tabu Search metaheuristic for Job Shop scheduling Problem with Generic Time Lags

Session Title: *Metaheuristic for Decision Aid-1*

Abstract: Job shop scheduling problem with generic time lags is defined as a job shop problem with minimal and maximal delays between starting times of operations of different jobs. It belongs to a category of problems known as NP-hard problem due to large solution space and thus it takes a long time to find an optimal solution. There are no algorithms which may produce optimal solution within polynomial time to solve these problems. In this paper, we propose a Tabu search metaheuristic for solving the Job Shop problem with Generic Time Lags. The numerical experiments are based on a set of 48 instances including 8 instances based on the flow shop Carlier's instances and on the well-known 40 Laurence's job shop instances.

Keywords: Scheduling, Job Shop, Generic Time Lags, Tabu Search, Decision Making

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Mixed load school bus routing problem optimization with metaheuristics

Session Title: *Metaheuristic for Decision Aid-1*

Abstract: This research paper is interested in solving the problem of School Bus Routing Problem (SBRP). SBRP seeks to find optimal routes for a fleet of buses, where each bus transports students from stops to schools and vice versa. In our problem mixed load is allowed, in that case, students of various schools can get together on the same bus at the same time. SBRP is known as an NP-hard combinatorial optimization problem. Several exact and approximate methods were used to solve this problem. However, in the case of the large-scale problems, the exact methods showed their limits. For this reason, we propose to solve this problem using two metaheuristics, which are Genetic Algorithm (GA) and Ant Colony Optimization algorithm (ACO), well known for their robustness and their global convergence.

In this paper, we formulate a mixed load SBRP as a constrained mixed integer programming problem using parameters and variables. The overarching objective of the SBRP resolution is to develop a mixed transportation plan which minimizes the number of buses used on all road networks and respecting various constraints such as buses capacities, buses travel time and students travel time. Despite the importance of mixed load for collective transport of students, the problems of school bus routing which authorizes this characteristic are rarely studied in literature. In addition, to solve this complex problem, researchers have mainly focused on the development and application of specific heuristics. In contrast, our contribution focuses on the design of a new solutions codification easy to be integrated to any metaheuristic algorithms. To demonstrate the usefulness of this codification, a real life SBRP is considered and solved using Genetic Algorithm (GA) and Ant Colony Optimization (ACO) method. Simulation results show that both algorithms are converged to two near optimal/optimal solutions. Moreover, as reported, the solutions obtained by GA are better than those by ACO. This is mainly due to the effectiveness and efficiency of GA and to the compliance of the proposed codification method with genetic operators.

Keywords: Combinatorial optimization, Vehicle routing, Mixed load SBRP, Metaheuristics, Genetic Algorithm (GA), Ant Colony Optimization algorithm (ACO)

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A Multi-Objective Evolutionary Approach Solving The Assignment and Scheduling Problem

Session Title: *Metaheuristic for Decision Aid-1*

Abstract: In this paper, we propose a multi-objective evolutionay approach based on dominance rules and multi-criteria concepts applied to support large volume maritime surveillance missions. The large scale surveillance problem is generally characterized by the employment of patrolling (e.g., helicopters, ships, satellites) and fixed (e.g., radar stations) surveillance assets in a large geographic area. Coastal and Arctic wide area surveillance are good examples of large volume surveillance problem. Therefore, one of the major decision problems of the large volume surveillance is the determination of efficient management solutions of patrolling assets to accomplish efficiently a set of surveillance and urgent tasks. Surveillance tasks are characterized by their dependencies, priorities, as well as time and space constraints. Moreover, tasks can be performed according to several modes. Each mode can be characterized by a task-time duration, resource consumption, cost and benefits.

Evolutionary algorithms have gained an increasing interest given their efficiency for solving hard multi-objective optimization problems. Though, EAs are not guaranteed to identify the Pareto set. Therefore, the performance of such algorithms is assessed based on the trade-offs between the diversity of discovered solutions and their convergence toward the Pareto front.

The approach was tested on a large set of randomly generated problems. The favorable results obtained can validate the effectiveness of the proposed algorithm.

Keywords: Evolutionary Approach, Assignment and Scheduling Problem, large volume Surveillance problem

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A Hybrid Uncertainty Multi Objective Decision Making Method: Stochastic Multi Choice Goal Programming

Session Title: *Decision and Uncertainty*

Abstract: During the last few decades, great efforts have been made to develop methods for dealing with imprecise and uncertain information that are present in a real world decision making problems. Hence, in order to develop good methodology, the stochastic goal programming (SGP) approach and the multi-choice aspiration level (MCAL) techniques have been suggested. In SGP problems, the goals are viewed as a random phenomenon and assumed that their normal distribution are known. However, in reality, the decision maker (DM) it is not always faced a stochastic cases to his real problems, at least in some cases, use MCAL technique may serve the purpose better. Although each method proved its effectiveness in dealing with uncertainties in real world decision making problems. In this paper, we propose a hybrid uncertainty goal programming for solving a multi objective transportation problems based on multi choice aspiration level (MCAL) technique and stochastic or scenario based goal programming approach. Two objectives are considered in this study: total cost and delivery time. We suppose that the total cost is multi-choice aspiration level and delivery time is of a stochastic nature.

Keywords: Stochastic goal programming, multi choice aspiration level, uncertainty goal programming, multi objective transportation problems

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Solving a Green Service Network Problem under Uncertainty using a Simulation-based Optimization Approach

Session Title: *Decision and Uncertainty*

Abstract: The globalization of the economy in the last decades has led to exponential growth in the global freight transportations. Many new challenges have risen in planning transportation, in terms of cost and time availability of resources. In addition to economic factors, such as fuel costs, environmental concerns are high on the agenda. Since, new regulations and taxes have been imposed in order to encourage companies to move to more sustainable solutions. In this context, a fundamentally crucial problematic for freight transportation companies is to deal with a Green Service Network Design (SND) Problem under uncertainty. Solving such SND problem remains one of the most active research topics in logistics field over the last decades. Unlike classic network flow problems, which can be solved very efficiently, SND has proven to be one of the most difficult combinatorial optimization problems.

In this work, we propose a simulation-based optimization model to address a multi-objective capacitated intermodal multi-commodity SND with demand and transit time uncertainty. The main challenge is to strike a balance between three conflicting objectives: low total service transportation and transshipment costs, low charges for delayed deliveries and low total carbon dioxide emissions. Time Transshipment constraints on the platforms and time windows on the orders delivery are considered. In fact, the complexity of this problem lies in taking into consideration multiple transportation modes and uncertainty in travel times and demands. The focus is not exclusively on the tactical scheduling of services, but also on their operational sequencing to routing plans which fulfill the demand and provide robust solutions with respect to uncertainties. We actually deal with a generalized version of the SND which proposes a fundamental unifying model for several well-known challenging logistics and transportation problems.

The originality of this work resides in the recourse to the Stochastic Simulation Modelling in order to incorporate efficiently the inherent uncertainty of the demand and the transit time. Actually recent studies prove that demand is generally well fitted with the lognormal distribution. Whereas, for travelling time, Mixture Gamma, Mixture Normal and Lognormal distributions are respectively the best fit for road, rail and waterway transportation modes. The proposed simulation model is coupled with an optimization model to solve the addressed Green SND problem. For that purpose, we use OptQuest black-box's optimization approach. This optimization combines three different techniques: Scatter Search, Taboo Search and Neural Network.

Experiments are conducted on a real-world case study to demonstrate the effectiveness and robustness of the proposed simulation-based optimization model. This case study was recently presented in a

research paper which addresses a problem of transportation on the Danube region between Hungary and Germany for carrying containers from and to the main European ports.

Keywords: Green Service Network Design, Uncertainty, Stochastic Simulation, Optimization

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Multiple Objective Portfolio Selection Models: Review of Deterministic and Stochastic Models

Session Title: *Decision and Uncertainty*

Abstract: This paper deals with multiple objective stochastic programming models for Portfolio Selection. First we provide a literature review of different areas of portfolio selection. An overview of the CAPM and different risk measures used to quantify the portfolio risk are reported. Second, we present an introduction to the MOP problem and different approaches and solutions strategies that were presented in the literature to solve such a problem. Third we provide the use of these models and solution strategies to solve the portfolio selection problem.A discussion of the stochastic aspect of the portfolio selection problem is after that presented and a short introduction to the single objective stochastic programming approaches and the multiple objective stochastic programming models. We report after from the literature, a set of these stochastic programming models that were developed to solve the portfolio selection problem.

Keywords: Portfolio Selection, Multiple Objective Programming, Multiple objective stochastic programming

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A Multiobjective Stochastic Model for Ambulance routing

Session Title: *Decision and Uncertainty*

Abstract: During the past decades, considerable research on vehicle routing and scheduling problems has been carried out. One of the earliest routing problems is the Vehicle Routing Problem (VRP). The Multi-depot Vehicle Routing problem (MDVRP) is an extension of VRP. In general, the MDVRP aims to find the best routes for several vehicles situated in multiple depots to satisfy demands of a set of customers and then return to the same depot. This paper presents a solution approach for a MDVRP with multiple objectives. Three conflicting objectives are considered, which are, minimizing the total travel cost of the vehicles, maximizing the effectiveness of the vehicles and minimizing the number of used vehicles. In this paper, we suggest that the number and locations of the depots are predetermined. The multi-objective MDVRP can be described as follows: Several heterogeneous ambulance located at different depots to transport sick or injured patients to and from hospitals. Each ambulance starts and finishes its route at the same depot (hospital). The demands are supposed of stochastic nature. As there are different types of ambulances, we should consider compatibility constraints. In order to generate our solution, we propose a deterministic equivalent problem. The proposed equivalent deterministic model will be tested using a real life case.

Keywords: Multi-objective programming, Multi-depot vehicle routing problem, Stochastic programming

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TOPSIS methods and group decision makers: new extension

Session Title: *Multiple Criteria Decision Aid*

Abstract: The introduction of reference points concept in the ranking procedures of multicriteria methods dates back to the early seventies. This reflection was quickly implemented by some researchers of this time. In the same way, Paul Yoon and Ching Lai Hwang [10] gave rise to the TOPSIS method essentially based on some concepts of multiobjective programming. Some years later a modified version of this method, called revised TOPSIS, was proposed by Deng et al.

In a previous work, we have presented a new derived method of the revised TOPSIS called TOPSIS-Nadir, its purpose is to improve the performance of the old one.

In this work, we present an extension to TOPSIS-Nadir method in the group decision makers area where we trait the crisp data and the interval data cases. Also, through a computer program, a comparative study between the extension of revised TOPSIS and the new extension is presented (a statistical study based mainly on randomly generated instances), it aims to show the effectiveness of the new one.

Keywords: Group decision makers, revised TOPSIS, anti ideal solution, nadir solution, crisp data and interval data

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Development of new distance and similarity measures between interactive criteria and their application to a GDM

Session Title: *Multiple Criteria Decision Aid*

Abstract: Different methodologies and theories have been developed to cope with the uncertainty in different types of real world problems. Fuzzy sets and their extensions, such as intuitionistic fuzzy sets (IFS), interval-valued intuitionistic fuzzy sets, linguistic fuzzy sets, HFSs and HFLTS, have provided a wide range of tools that are able to deal with this uncertainty. Distance and similarity measures are two important topics in the uncertain field.

Distance and similarity measure are common tools in the process of decision making [1][2][3][4]; they are widely used in measuring the deviation and closeness degrees of different arguments. So, these measures have been extensively implemented in a variety of scientific fields such as pattern recognition

[5][6][7][8][9], machine learning [10][11], market prediction, medical diagnosis [12][13] biology models [14] and so on. Lots of other studies have been done on this issue[15] [16] [17] [18].

The most widely used distance measures in the literature [19][20][21] are the Hamming distance, Euclidean distance and Hausdorff metric distance. Based on these distance measures, many extensions have been developed [22]. All these extensions of distance measures do not take into account the interaction between the criteria.

In this contribution, we deal with this limit based on hesitant fuzzy linguistic distance measures [23]. To do so, we develop new distance and similarity measures using the plausibility theorem and Choquet Integral [24] such as hesitant fuzzy linguistic interaction distance (HFLID) operator and hesitant fuzzy linguistic ordered interaction distance (HFLOID) operator.

The different properties of the proposed operators are discussed and a GDM problem is given to show the different steps of computation.

Keywords: distance measure, similarity measure, HFLTS, Plausibility theorem, choquet integral

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Ranking with PROMETHEE Method by using aggregation operators

Session Title: *Multiple Criteria Decision Aid*

Abstract: PROMETHEE II is a prominent outranking method that builds a complete ranking on a set of actions with aggregation. In multicriteria decision making, the main idea is aggregating individual preference into one element. Therefore, as an alternative, we propose an aggregation that approximates PROMETHEE II's net flow scores without requiring costly pairwise comparisons. To show the relationship between argument evaluations, an aggregationoperator as Arithmetic, Geometric,

Harmonic, Bonferroni and Heronian mean is applied and for which the consistency property of the pairewise comparison is ensured. In addition, Choquet Integral is used too as an aggregation function. We study the properties of these aggregation operators and discuss their special cases. Experimental results on real problem show an improvement of the result compared with other method. This observation leads us to provide empirical bounds above which the PROMETHEE II-ranking of an action set is satisfying by our aggreration with several aggregation mean operators and Choquet Integral.

Keywords: Aggregation function, Heronian mean, Geometric mean, Harmonic mean, Bonferroni mean, Choquet Integral, Outranking method, PROMETHEE method, Ranking

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Evaluation of MCDA methods: theoretical study & results

Session Title: *Multiple Criteria Decision Aid*

Abstract: The multicriteria decision aid approach [7], [8] appears as alternative to the classical optimization methods based on the definition of a single function. It consists in the consideration of several conflicting criteria of different natures.

This approach consists to propose an answer (one solution or more) to the decision problem, without necessarily turning the whole set of criteria into a single function. In this case, instead to search an optimum, the analyst tries to define a compromise solution under various forms: choice, sorting or ranking [7], [8]. This approach allows us to distinguish several multicriteria methods, to each one its theoretical framework and methodological aspect.

Since the appearance of multicriteria decision methods, a huge number of real-life problems were successfully resolved, but this doesn't prevent the scientists to ask about their efficiency and the reliability of the results provided.

In fact, numerous research works have been conducted in order to study the performance of some of MCDA methods, especially: AHP, the multiplicative model, Electre...etc. These works have shown a remarkable instability and weaknesses in the definition of the best (s) alternative as well as the global ranking of alternatives.

Through this last observation, the obligation to inform the decision maker about limitations accompanying the use of each method became inevitable. This has increased the need to develop new methods sufficiently effective or define new evaluation tests, two research fields that gave rise, since the early eighties, to an immense literature.

In this context, we cite some research works treating the reliability study of MCDA methods, in particular, those concerning the establishment of some performance tests. This action has been undertaken, after observing the impossibility to proceed by comparison between methods (how can compare methods which the context of work is different?!). A new area explored, recently, by some researchers, especially, E.Triantaphyllou in the late eighties. Where, many results and comparative studies have been carried out.

E.Triantaphyllou, during years of research, devoted himself to the development of numerous tests which based essentially on some mathematical properties listed in the famous theorem of Arrow. This reflection seems to be logical; however, it met a severe criticism from B.Roy and his collaborator in [16].

In the same way, we carried out a critical study to evaluate the latest version of Triantaphyllou's tests. Firstly, a realizability study considering the three tests together is proposed, After that, we study separately the reliability of each test. This study gave rise to surprising results about the realizability of this series of tests.

This document will then be divided into two major parts. In the first part, a summary of the evolution through time of Triantaphyllou's tests is given, after that an analysis of the three tests together is established. In the second part, a stability study of some multi-criteria methods for the application of the three tests separately is proposed. Theoretical discussions and numerical examples in order to criticize the performance of these tests are also presented. In the same part, we carried out a synthesis about the effectiveness of each test in the case of MCDA methods from different approaches.

Keywords: MCDA, MCDA methods, the series of tests, Independence property, Transitivity property

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The control dilution of the initial controlling shareholder post-Initial Public Offering: Determinants and implications in the French context

Session Title: *Corporate governance 1*

Abstract: We investigate the determinants of initial controlling shareholder's control dilution over five years post-initial public offering. We use a cross sectional probit regression on a sample of 165 French initial public offering firms over the period 1999-2015. Our findings show that, 1) Controlling shareholdings are high and stable post-initial public offering. 2) We find that the probability of initial controlling shareholder's control dilution decreases with high private benefits of control and that family initial controlling shareholders are less likely to experience large control dilution by 5% or more than non-family ones. 3) The likelihood of initial controlling shareholder's control dilution increases with control concentration, high levered firms and with new equity issue. 4) We show that high private benefits of control and free cash flow are considered as obstacles for dilution through block sales. Our results confirm that control concentration incites initial controlling shareholder to dilute through block sales.

Keywords: Family firm, Initial public offering, Controlling shareholder, Control dilution

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Product Market Predatory Threats and the Cost of Equity

Session Title: *Corporate governance 1*

Abstract: In line with recent research showing that product market competition can lessen agency problems, we document that a firm cost of equity capital is negatively related to existing and potential market threats. The association is statically and economically significant. We also find that the magnitude of the effect of product market threats on cost of equity has decreased following the introduction of The Sarbanes–Oxley Act of 2002. Our results are robust across different product market competition measures, to various cost of equity models, and to a variety of alternative specifications.

Our conclusion also holds after accounting for analyst forecast bias, and potential endogeneity problem. This study is the first introduces product market threats as a determinant of cost capital.

Keywords: Cost of equity capital, Product market competition, Corporate governance

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Employee Well-being and Debt Maturity

Session Title: *Corporate governance 1*

Abstract: This study examines the impact of firms' commitment to employee well-being on corporate debt maturity structure in the context of American firms. We hypothesize that higher scores for employee well-being can be conductive to the use of more short-term debt or long-term debt. Using a sample of 19,347 firm-years from U.S. firms over the 1991-2014 period, we find strong evidence that firms that are more committed to employee welfare tend to take on more long-term debt. This relation is more pronounced for firms in human-capital-intensive industries. We address endogeneity concerns and a number of checks. The findings are robust to the use of alternative regression frameworks, variables' measures, and sample compositions. We provide novel evidence on the role of employee welfare practices in a firm's debt maturity structure. This study has several implications in terms of human resource management and evaluation of creditworthiness.

Keywords: debt maturity, employee welfare, corporate social responsibility, stakeholders

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Analyst following and the influence of board components and ownership

Session Title: *Corporate governance 1*

Abstract: Financial analysts serve an important role as intermediaries between firms and investors. This study investigates how the corporate governance structure affects the extent of analyst following in a context of poor investor protection country as France. Overall, the empirical results suggest that analysts are less likely to follow firms with potential incentives to withhold or manipulate information, such as when firms suffer from high principal-principal agency conflict. Specifically, we find that analyst coverage is negatively associated with ownership concentration and excess control of major shareholders. Our results show also that board size, board independence and the separation between the chairman and the CEO affect positively analyst coverage. Overall, our findings suggest that corporate governance plays an important role in analysts' willingness to follow firms.

Keywords: corporate governance, analyst following, principal-principal agency conflict, ownership concentration, board structure

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Dynamic international facility location under uncertainties: A review and insights

Session Title: *Decision Aid in Production Management*

Abstract: One of the key questions to be addressed when designing a supply chain network is the location of facilities such as warehouses, distribution centres and factories. This strategic issue gave rise to the development of facility location models that aim at finding the best possible locations for facilities and assigning customers to them (see [1] for a review on facility location models in supply chain management). Since decision making in this case involves long-term planning, the development of multi-period facility location models is needed in order to take into account the time-dependency of the problem input data and decision variables [2]. Moreover, the improvement of the practical relevancy of these models requires the incorporation of realistic features and constraints from real-life applications. Namely, in a global context, several factors such as tariff rates, taxes, government incentives, currency

exchange rates, etc. might influence the investment decisions and thus should be considered in the problem modeling. On the other hand, an international facility location problem is usually subject to uncertainties in its input data. For instance, customer demand cannot be predicted with certainty, exchange rates might be unstable and prices or variable costs might fluctuate in each country. This variability must be accounted for when designing the supply chain network so that the obtained solution performs well over all possible scenarios [3].

In this work, we consider multi-period international facility location under uncertainty. Firstly, we propose a review of the relevant literature with a focus on the papers modeling time-dependency and uncertainties. We point out that most papers dealing with the design of international supply chain networks assume deterministic input data (an exception can be found e.g. in [4]), and thus addressing stochastic models is a subject that deserves a better consideration in the future. Secondly, we carry out a numerical study with the objective to derive insights on: 1- the impact of international factors on the supply chain network configuration, 2- the value of using stochastic models. We adopt a two-stage stochastic programming approach where it is assumed that strategic facility location decisions have to be made “here and now”, in a first stage, when information about the random parameters of the supply chain is not fully provided. In a second stage, tactical decisions regarding distribution flows can be made, after a certain scenario of the problem parameters realizes. The overall objective is to determine a supply chain network, such that the expected profit is maximized.

In our numerical study, we consider realistic data from the case of a multinational company planning to expand its supply chain network through the construction of new distribution centers (DCs). Semi-finished products are sourced from the company's factories situated in different locations and are then customized in DCs before being shipped to markets (no inventory is maintained in DCs). Given the amount and location of demand in each market as well as the location of factories, our objective is to determine the best locations for distribution centers (among a list of potential locations) so as to maximize after-tax profits of the company over the planning horizon. In the objective function, we consider the payment of corporate income taxes as well as fixed costs and penalties for not satisfying demand. Fixed costs involve the investments made at the beginning of the planning horizon to open new distribution centers. According to the country of location, the initial investment may be reduced if there are incentives to attract investors. More specifically, in the present work, we assume that each country may offer a cash grant to the multinational company if it decides to open a DC in the country. The revenue of each DC in each time period consists of the sales price paid by each market. Variable

costs include the purchase costs from factories (called transfer prices if factories and DCs belong to the same mother company), the inbound transportation costs, the outbound transportation costs as well as the variable costs of customization. We also assume that in each country where a DC is located, the company has to pay tariffs when importing semi-finished products.

The conclusions drawn from our numerical study show the impact of international factors on investment decisions as well as the added value of stochastic modeling in case the exchange rates or the demand growth rates are subject to uncertainties.

Keywords: International supply chain network design, Dynamic stochastic facility location, MILP

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Using System Approach and Decision Making in Production

Session Title: *Decision Aid in Production Management*

Abstract: Extended abstract:

The economic evolution pushes companies to review constantly their prospects to follow the trends in the market, do not miss any technological turn and especially to engage in a process of continuous improvement. It now appears that the effort must be focused on all of the activities carried out by all functions of the company (technical, logistical and administrative) to be able to persist in an environment where the optimal response to the client is at the heart of the strategies of firms.

Operations managers are required to make a series of decisions in the production function. They plan, organize, staff, direct and control all the activities in the process of converting all the inputs into finished products.

In current global economic development has created a very dynamic environment where technologies in all areas have become more and more advanced, compared to some years previously. This environment imposes, therefore, all industries, all confused, to always be in tune with this development, and activities to have vigilant eyes on the tough competition between companies in the same sector. To this

fact, and having to deal with customers who are becoming more and more demanding, manufacturers constantly to ensure permanent and continuous production systems improvement to eliminating all forms of waste.

Companies must not only invest and produce but mainly optimize their processes and upgrade their systems in order to ensure their compliance against the standards of the current standards and thus a fine satisfaction of their customers.

This paper presents two industrial applications. It's the optimization and the development of production surfaces of a site on the one hand and the establishment of software of management quality within a pharmaceutical company.

The first application concerns the optimization of the surfaces of the site and the arrangement of production lines. In fact, we proceeded to a diagnosis which allowed us to identify the gaps of the system of production on the one hand, and an analysis based on the Objective Oriented Project Planning method (OOPP), on the other hand.

The second application firstly aims to ensure implementation of quality within pharmaceutical company management software and this ensuring the setting, the development of a manual facilitating personnel training and more implementation of a dependability method in a second part in describing methodology approach and in dealing with a case study.

Today, industry has become more and more demanding, including the pharmaceutical industry which is framed by a specific regulatory context. Stringent requirements must be applied throughout the lifecycle of a drug in order to guarantee the quality of medicinal products placed on the market and the safety of patients.

It should be therefore pharmaceutical settlements to implement a system of quality management efficient and accurate that defines a policy and quality objectives to control and continuous improvement of processes, the quality management system includes primarily a system which documents practices and ensures traceability, a verification system that evaluates the compliance of the process compared to the prescribed requirements and that via of audits and internal controls periodic quality and a system analysis of the results to the executive level which is based on an analysis for decision making (indicators of performance, management review).

In order to properly manage their integrated management system, businesses rely on sophisticated tools facilitating steering and this via software packages that include rich functionality covering all

requirements of the standards in terms of quality management, environment and health and safety at work.

Keywords: System approach, decision making, optimization, management quality, OOPP method

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SCADA System and Dependability Study for Helping in the Decision Making

Session Title: *Decision Aid in Production Management*

Abstract: Extended abstract: The operation and maintenance of thermal power plants require consideration, precise diagnostics on failure and agility on system recovery. In addition, each operation needs to be carefully planned and executed, once errors can be critical. To improve the operation and maintenance tasks, in this article is presented the proposal of a support system for decision making units based on supervisory control and data acquisition (SCADA) system and dependability study for thermal power plants.

With the advances of electronic and software technologies, the SCADA systems are generally used in industrial plant automation. It provides an efficient tool to monitor and control equipment in manufacturing processes on-line. The SCADA automation system always includes several functions, e.g., signal sensing, control, human machine interface, management, and networking.

Today, the supervision of thermal power plants is more and more complex to perform, not only because of the number of variables always more numerous to monitor but also because of the numerous interrelations existing between them, very difficult to interpret when the process is highly automated.

The challenge of the future years is based on the design of support systems which let an active part to the supervisory operators by supplying tools and information allowing them to understand the running

of production equipment. Indeed, the traditional supervisory systems present many already known problems. First, whereas sometimes the operator is saturated by an information overload, some other times the information under load does not permit them to update their mental model of the supervised process.

Moreover, the supervisory operator has a tendency to wait for the alarm to act, instead of trying to foresee or anticipate abnormal states of the system. So, to avoid these perverse effects and to make operator's work more active, the design of future supervisory systems has to be human centered in order to optimize Man-Machine interactions. It seems in fact important to supply the means to this operator to perform his own evaluation of the process state.

In fact, a SCADA system provides information of the thermal power plant status in real time, which helps in the decision-making during and after the process. Events and alarms are the bases for system status comprehend and decision making. Alarm management is a traditional feature of SCADA and production management systems.

To reach this objective, dependability study seems based on functional and dysfunctional techniques to be a promising research method. In fact, allowing the running of the production equipment to be understood, these techniques permit designers to determine the good information to display through the supervisory interfaces dedicated to each kind of supervisory task (monitoring, diagnosis, action, etc.). In addition, dependability study could be a good help to design support systems such as alarm filtering systems.

Keywords: SCADA, dependability, decision making, thermal power plant

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Carbon emissions, renewable and non-renewable electricity consumption, and economic growth: Assessing the evidence from Algeria

Session Title: *Decision Aid in Production Management*

Abstract: More than 80% of human-caused carbon emissions come from burning fossil fuels. The imperative to reduce CO2 emissions is stronger than ever and renewable energy is the most viable option for reducing energy-related emissions. The present study explores the causal relationship between CO2 emissions, renewable electricity consumption, non-renewable electricity consumption and economic growth for Algeria over the period 1980-2012. To examine short-run, long-run and joint causality relationships we used a multivariate cointegration approach based on the recent advances in time series econometrics (e.g. Zivot-Andrews test ; ARDL cointegration test ; Vector Error Correction Models (VECM)). The empirical results revealed the existence of cointegration among the series. In addition for the long-run, economic growth, non-renewable and renewable electricity consumption Granger causes CO2 emissions. However, in short-run, results illustrate a unidirectional causality relationship running from GDP to NREC, supportive of the conservation hypothesis. The econometric evidence seems to suggest that renewable electricity consumption can help to mitigate CO2 emissions in Algeria, but so far, renewable electricity generation has not reached a level where it can make a significant contribution to emissions reduction.

Keywords: renewable and non-renewable electricity consumption, CO2 emissions, Economic growth, Granger causality, Algeria

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Channel Coordination with Quantity Discounts and/or Cooperative Advertising

Session Title: *Decision Making in Supply Chain Management 2*

Abstract: We assess the interactive effects of two commonly used channel coordination mechanisms (quantity discounts (QD) ad cooperative advertising (CA)). We use a game-theoretic model and solve four non-cooperative games. In the first game, neither quantity discounts nor cooperative advertising is implemented. Cooperative advertising alone is offered in the second game, while quantity discount alone is offered in the third game. In the fourth game, both quantity discount and cooperative advertising is implemented. We obtain analytical solutions and compare equilibrium results across games to assess the effectiveness of CA (QD) when implemented alone or jointly with QD (CA). The main findings suggest that the profitability of each of these mechanisms is affected by whether the other is

implemented or not in the channel. For example, while cooperative advertising benefits the manufacturer when implemented alone, it can increase or decrease the manufacturer's profit when added to quantity discounts. Looking at which coordination mechanism is most effective when used alone, we find that both the manufacturer and the supply chain prefer quantity discounts to cooperative advertising. Finally, the retailer may not benefit from either one or both of these coordination mechanisms, especially if marketing efforts are not highly effective.

Keywords: Supply chain coordination, Quantity discounts, Cooperative advertising, Game theory

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Integration of fuzzy AHP-TOPSIS method for prioritizing the solutions of Knowledge Management adoption in Supply Chain to overcome its barriers

Session Title: *Decision Making in Supply Chain Management 2*

Abstract: Knowledge Management (KM) and Supply Chain (SC) have taken more than a decade to facilitate mature disciplines where they can be exploited for enhancing business profitability and value. KM treats knowledge and manages it in a systematic way to achieve the goal of enhancement of performance and competitiveness. The incomplete understanding within an organization or between trading partners belonging to the same SC causes KM adoption in SC to fail. In view of this, it is essential to identify barriers of KM adoption in SC. The barriers can identified through literature review and expert opinion. However, these barriers are significant but not possible to overcome all at the same time. Hence it is noticed that in order to enhance KM adoption in SC successful, concrete and feasible solutions must be proposed and ranked to overcome these barriers in stepwise manner.

The aim of this study is to explore the barriers of KM adoption in SC and propose and prioritize the solutions to overcome these barriers . It helps organizations to concentrate on high rank solutions and develop strategies to implement them on priority basis to overcome the barriers of KM adoption in SC and achieve competitive advantage. To prioritize the solutions of KM adoption is multi criteria decision making (MCDM) problem. Human judgment in decision making has been often unclear and hard to

estimate by exact numerical values. Hence fuzzy logic is necessary for handling problems characterized by vagueness and imprecision.

Our paper proposes a framework based on fuzzy analytical hierarchy process (AHP) and fuzzy technique for order performance by similarity to ideal solution (TOPSIS) to identify and rank the solutions of KM adoption in SC and overcome its barriers. The AHP is used to determine weights of the barriers as criteria, and fuzzy TOPSIS method is used to obtain performance ratings of feasible solutions with triangular fuzzy numbers (TFN).

Keywords: Knowledge Management, Supply Chain, obstacles, solutions, Fuzzy AHP-TOPSIS

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Application of Fuzzy ANP approach for prioritization of the partner selection criteria

Session Title: *Decision Making in Supply Chain Management 2*

Abstract: A Virtual Enterprise(VE) is a temporary association of a set of enterprises core competencies. Its formation needs to adopt the most appropriate partners in any given Business Opportunity. Therefore, partner selection becomes a crucial issue of the collaborative network management. It is considered as a complex Multi-Criteria Decision-Making (MCDM) problem, and its complexity is more accentuated if the interdependence among the selection criteria is taken into consideration. In this paper, seven measures are considered proper for partner selection process in a VE context. A Fuzzy Analytical Network Process is applied to weight the extracted measures and determine their importance level.

Keywords: Partner selection, Criteria weight, Fuzzy ANP, Fuzzy Preference Programming

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Impact of Multi-Behaviors Actors on the Performance of a Supply Chain based on Six Sigma Approach

Session Title: *Decision Making in Supply Chain Management 2*

Abstract: In the current industrial context, competitiveness is strongly associated with the performance of the supply chain. The behavioral study of the different actors is essential for production and delivery of products to customers on time and at a competitive price. Since each channel actor can adopt different behaviors and all reactions of all actors will impact the overall performance, it appears essential to analyze the most influential behavioral factors on the supply chain.

Nowadays, any company directs its resources and efforts towards the performance of its supply chain. The literature has highlighted several supply chain performance evaluation models. However, the majority of these models ignore the behavioral aspect of agents in a chain. According to the cognitive science emergence in industrial environments, the study of actors' multi behaviors in a supply chain increases.

It is in this context that occur our research which is based on a qualitative management approach -Six Sigma- with using quantitative tools such as the Principal Components Analysis and the Logit Model to analyze and predict the occurrence of behavioral problems in a supply chain. This is in order to support and enhance a continuous performance of a supply chain.

Keywords: Performance of a Supply Chain, Actors multi-behaviors Six Sigma method, Logit Model, Principal Components Analysis

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A New Approach for Home Health Care Planning Problem

Session Title: *Decision and Health sciences 1*

Abstract: We present here a two steps solving procedure applied to a HHC planning problem. This approach aims to give a new metric, based on interval analysis, for the flexibility of a schedule.

The obtained results will be used for our future research related to robustness studies.

Keywords: Home Health Care, Planning, MILP Model, Flexibility, Interval Analysis

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Multi-Start Local Search for Nurse Rostering Problem

Session Title: *Decision and Health sciences 1*

Abstract: In this paper, we address the Nurse Rostering Problem (NRP) which requires the production of a periodic roster for a set of nurses that satisfies the requirements of the institution and personnel preferences .

The NRP is an optimization problem or constraint satisfaction problem where each nurse is assigned to one shift per day according to their skill level in order to meet the minimal coverage constraints taking into account both hard and soft constraints where the goal is to satisfy the nurses' preferences as far as possible and to minimize the soft constraints violations costs.

Being computationally intractable, a practical approach to solving it is a heuristic capable of delivering a good roster in a reasonable amount of computing time. A two-phase memoryless multi-start approach is proposed for this purpose, integrating as low-level procedure the local search heuristic. A feasible roster is constructed during the first phase; while the second phase consists of improving the roster constructed in the phase one. The restart mechanism takes the outcome of phase two and destroys-repairs it. To the best of our knowledge, this is the first time a multi-start local search method is proposed for the NRP. It is tested on benchmark instances from NSPLib, and compared with the state-of-the-art.

Keywords: Nurse rostering, multi-start, local search, destroy-repair, heuristic and metaheuristic

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Modeling and Performance Evaluation of the offices in an institution of health coverage

Session Title: *Decision and Health sciences 1*

Abstract: Queues management issues have been the focus of a large number of published articles. Despite the diversity of the problems of queue, the management of the queues of health coverage has been little explored by researchers. In this paper we try to minimize the waiting time in the health coverage devices which have today great importance in our society because almost the totality of citizens are members of health converage company. By exploiting the technique of simulation with the aid of software ARENA, we modeled a health coverage institution in Tunisia. Then, we proposed some alternatives to improve the services provided by the latter. The choice of the best solution is based on three criteria obtained from TOPSIS method after determining the importance of performance criteria by AHP method: the amount of waiting time in queues, the number of the couvertis persons served and the total cost. The experimental results show the efficiency of our suggestion.

Keywords: Queuing, Modelling, Health coverage, Discrete event simulation, A hybrid multicriteria method

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Risk Assessment of Hospital Sterilisation Process Using FMECA Approach

Session Title: *Decision and Health sciences 1*

Abstract: Risk management is important for all types of organizations, but it's especially important in healthcare because human lives might be on the line. A good healthcare risk management plan can reduce patient health risks as well as financial and liability risks. As always, and regardless of the industry, a good risk management plan will be developed, implemented, and monitored. A hospital must

identify the type of risks it is taking, as well as measure, report on, and set systems in place to manage and limit those risks.

In hospital, supply chain management involves the internal chain, including patient care unit, hospital storage, patient, and etc., and the external chain, including vendors, manufacturers, distributors, and etc. Healthcare SCM processes have three types of flows: physical product flow, information flow, and financial flow. The physical product flow manages customized products and services for the treatment of patients and their needs, such as the sterilisation of the Reusable Medical Devices (RMD).

The main role of a hospital sterilization services is to disinfect all Medical Devices (MD) that were used in a surgical operation and can be reused in a new surgical operations in order to avoid and prevent any nosocomial infection.

Sterilization is a cyclic process consisting of several steps which are; pre-disinfection, rinsing and washing, verification, packing, sterilization, storage and reutilization in operating theaters. This service is vulnerable to risks, due to the contagious nature of their environment and to the degradation that risks can cause to the safety of patients and staff. In relation to this issue, our work aims to analyse and evaluate risks of sterilisation process, then propose some improving actions in a real hospital case in order to improve the quality healthcare service.

By definition, risk analysis is the process of defining and analyzing the risks that may appear in a system. It aims to improve system security by reducing the risks criticality. It can be either qualitative, when different corrective actions are token, the extent of vulnerabilities are specified, or the security measure are fixed, or quantitative, when probability of an event occurring and its severity are taken into account, which makes it possible to rank events in order to rank risk and to make decisions based upon this ranking [Villemeur, 1992].

Several methods exist to perform risk analysis such as FMECA (Failure Mode, Effects and Criticality Analysis). It is a proactive risk assessment tool used to identify potential vulnerabilities in complex, high-risk processes and to generate remedial actions to counteract them before they result in adverse events. Although developed by engineers and originally employed in high-risk industries such as aviation and nuclear power, FMECA is now increasingly used to proactively assess and improve the safety of complex health care processes, including intravenous drug administration, blood transfusion, and sterilization of surgical instruments [Laura Ashley et al., 2010].

In this context, this communication present the different steps of a hospital sterilisation process in a maternity service. Through interviews led with nurses of service, risks are determined and classified using the ISHIKAWA diagram. Then we use the Failure Mode Effects and Criticality Analysis method (FMECA) to analyze and evaluate the different failure modes. A level of priority risks was calculated to classify and determine the critical risks. Finally, to reduce sterilisation risks and present an improving plan we suggest a simulation model.

Keywords: healthcare supply chain, risk management, sterilisation process

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A DSS based on a genetic algorithm for solving the hydrogen transportation problem

Session Title: *Security and Routing Problems*

Abstract: We address in this paper a hydrogen transportation management problem within the supply chain. The hydrogen in the liquid or gaseous state has to be transported to numerous destinations (storage points or final customers) while considering specific product requirements. We focus on the liquid hydrogen transportation problem modeled as a vehicle routing problem with time windows, as the customers generally imposes a time interval for the delivery. We develop a decision support system based on a genetic approach to solve this problem and drive a series of experiments on Solomon's benchmark. We show through empirical study that the genetic algorithm outperforms state-ofthe-art approaches.

Keywords: hydrogen supply chain, genetic algorithm, hhydrogen transportation, DSS

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Vehicular Cloud Computing for Tourism Services and Intelligent Traffic Control

Session Title: *Security and Routing Problems*

Abstract: A Vehicular Ad-Hoc Network (VANET) is considered as a Mobile Ad-Hoc Network (MANET). Its usefulness in diverse VANET applications, such as infotainment, road safety and public safety, has made it an important emerging area of research. VANET is created by establishing a network of vehicles for specific needs or situations. In this mobile network, vehicles are ideal observation platforms for the environment. Indeed, they can capture and memorize a large number of details. Moreover, the information they store has local relevance [1].

However, due to mobility constraints and driver's behavior, VANETs has several challenging characteristics considerably different from many generic MANETs, such as potentially large scale and high mobility, which leads to a dynamic network topology. Besides, vehicles are equipped with On Board Unit (OBU) to achieve the VANET-related tasks. Nevertheless, OBU is a resource-constrained device with limited computational and storage capacity.

Besides, the technology of cloud computing is revolutionizing the world of business and IT sphere as it increases the speed, performance and QoS of the traditional information systems. Obviously, with the great advance of vehicle technology, we believe that the concept of Vehicle Cloud (VC) will be deployed in the future to extend VANETs application. In some cases, when Vehicle-to-Infrastructure (V2I) communications are unavailable, have failed or are too expensive, Vehicle-to-Vehicle (V2V) communications will be the appropriate possible alternative, enabling VC services to guarantee steady and very high data rates; the ability to control the traffic; and robustness under routing-level attacks.

The integration of vehicular networks and cloud computing has opened up a myriad of possibilities, new strategies and opportunities. Clouds provide cheap storage and considerable computation power which could be used to relieve the computation and storage overheads of the resource-constrained OBUs on the vehicles. The overhead of the huge amount of data storage and intensive time consuming computations can be easily offloaded to the clouds. In particular, solutions proposed to overcome problems related to the challenging traffic control, such as routing of vehicles, can be redesigned using a hierarchy and clustering techniques [2], [3]. In fact, each vehicle has a virtual image in the cloud, which stores its metadata, such as the current location, nearby Road Side Units (RSUs), etc... In addition, metadata from the vehicle virtual images can be used to easily create clusters and perform efficient routing scheme in cloud. Since clustering, inter-clustering and intra-clustering communications are

offloaded to the cloud, path computations can be simply performed taking into consideration QoS parameters.

The aim of this work is to investigate the integration of cloud computing with vehicular ad-hoc networks in order to design schemes for data retrieval and routing algorithms for VANETs through clouds by forming a scalable and stable clustered structure satisfying some constraints. The latter include, for instance, minimizing the number of cluster heads, reducing control communication overheads and the energy cost, etc… All of the previously-mentioned issues represent NP-hard problems [4] that can be handled by using heuristic methods providing feasible solutions in polynomial time. Our contribution is to design these heuristic methods. As an extension, the proposed approach will be used for traffic control and driver's security as well as for other VANET services, such as tourism services, traffic safety and control in Oman.

Keywords: VANET, Cloud computing, Vehicle Cloud, Clustering, QoS, Optimization, Heuristic

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An Evolutionary based Semantic Annotator and an Effective Model for Semantic Information Retrieval Systems in Semantic Web

Session Title: *Security and Routing Problems*

Abstract: Today's web based Information Retrieval (IR) systems retrieve only relevant information based on the keywords, which is inadequate for the search of required data from vast amount of data storage. It offers only limited functionalities to retrieve the required information of the end-user needs and based on the relation between the keywords. These limitations open a path to the further research in conceptual search which integrates the concepts and meanings. This work deals with the Semantic Based Information Retrieval System for a semantic web search and presented with an improved algorithm to retrieve the information in a more efficient way. In the proposed work, input query is converted to semantic query with the help of semantic query the converter then will feed the query to

the semantic content retriever. The semantic query converter takes input as plain keywords and it converts the meaningless words into meaningful sentences using the domain ontology and its relevancy. In this research an evolutionary based semantic annotator is proposed to retrieve the relevant information. The experimental results reveals that the proposed model improves the accuracy and effectiveness for retrieving relevant web documents.

Keywords: Semantic Web, Information Retrieval, Evolutionary Algorithms, Semantic Indexing

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Assessment of traffic congestion in arterial roads of Tunisian Metropolitan City

Session Title: *Security and Routing Problems*

Abstract: Traffic congestion is the main urban transportation problem, leading undesirable consequences for most cities around the world. Many largest cities in Tunisia, specifically the capital Tunis are facing this challenge and are cruelly affected by the urban mobility problem. This paper investigate the effects of commuters departure time choice on facility congested subject, when there are recurrent fluctuations in capacity and demand. Looking for flexibility in diverse departure times for the morning trip to work, we examine the time and space distribution characteristics of the traffic congestion and bottlenecks in different largest and most congested arterial roads in Tunis city. The study of eighteen isolated arterial thoroughfares, reveals the average travel time to be about 30 minutes. During peak hours, when the number of vehicles increase, the average travelling time is tripled which decreases free moving speed. The real results provide precious insight into the effects of traffic system and socioeconomic conditions on the frequency of route and departure time changes. The results have also valuable input for future public planning policies.

Keywords: Accessibility, Bottlenecks, Travel Time Variability.

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Equity Pricing in Islamic Banks: International Evidence

Session Title: *Financial Decision Making*

Abstract: Using a large sample of publicly listed banks in 68 countries over the 1999-2012 period,we assess the ex-ante cost of equity financing of Islamic banks and compare it to the ex ante cost of equity capital of conventional banks. We show that Islamic banks have, on average, higher equity financing cost than conventional banks. The difference is economically significant, 258 bp, and is persistent across the four cost of equity models: Claus and Thomas (2001), Easton (2004), Gebhardt et al. (2001), and Ohlson and Juettner-Nauroth (2005). Interestingly, the documented difference in the cost of equity among the two banking systems largely varies across countries and can be partially explained by institutional factors. We find the institutional quality to improve the cost of equity for both Islamic banks and conventional banks, with the effect being more pronounced for the Islamic banking system. Our findings are robust to alternative assumptions and model specifications, disproportionate analyst coverage relative to firm size, and other firm-specific and country-specific factors.

Keywords: Islamic banks, Cost of Equity, Institutional environment

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Portfolio selection strategy for Italian fixed income market

Session Title: *Financial Decision Making*

Abstract: In this paper, we discuss and examine the portfolio optimization problems in the Italian fixed income market considering two main sources of risk: prices risk and market risk. To achieve this aim, we first classify all different types of bonds traded on Italian market and then we propose a two-step optimization problem for each class. In particular, we manage the price risk implementing the classical immunization method and then, using the ex-post results from the optimal immunization problem, we are able to deal with market risk maximizing the portfolio wealth in a reward-risk framework. Adopting this approach, the paper then explores empirical applications on the Italian fixed income market using data for the period 2000-2015. Empirical results shows that the two-step optimization build efficient portfolios that minimize the price risk and the market risk. This ex-post analysis indicates the usefulness of the proposed methodology, maximizing the investor's wealth and understanding the dynamics of the bonds

Keywords: Portfolio selection, bond market, immunization, reward-risk measure

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A Multiple Criteria Approach for Working Capitals

Session Title: *Financial Decision Making*

Abstract: Working capital is one of the important financial policies that deals with managing the day-to-day short-term operations of a firm. It affects a firm's value, liquidity, and profitability; therefore, firms aim to achieve an efficient management of working capital. Furthermore, efficient working capital management protects firms from potential financial problems, the liquidity shortage, during the recent financial crisis 2007-2008, has highlighted the significance of short-term financial policies one of which is the working capital management.

Prior literature has indicated two challenges in the working capital management. First, is the determination of an optimal level of working capital that takes into account not only the fact that the components of working capital i.e. level of accounts receivable, inventory and accounts payable are

determined simultaneously, because they are interrelated, but also their stochastic aspects. Second, is the impact of working capital on the conflicting, yet equally important objectives, liquidity and profitability.

In this paper, we propose a multiple objective stochastic programming model to select an efficient strategy in dealing with working capital. For instance, aggressive (conservative) working capital policy has a positive (negative) impact on profitability but a negative (positive) impact on liquidity.

Keywords: Working Capital, Multiple Objective Optimization, Stochastic Programming, Goal Programming

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A Ratio-Behavioral explanation of subprime crisis: Multi Agent Systems modeling and simulation in Artificial Financial Markets

Session Title: *Financial Decision Making*

Abstract: In this paper we aim to explain the financial crisis via the investors' behaviors and reasoning. Specifically, we focus on the behavioral attitude and the rational analysis of the investor in a dynamic stock market during the crisis period.

To validate our model, we build an artificial stock market simulation during the financial crisis of 2007-2008. The object of this simulation is to understand the influence of the investor's psychological characters and rational analysis on the decision making process, the impact of the investor's decision on the real estate bubble formation, and the dramatic decline in risky asset classes' values during the crisis period. In the present work, we study four main important agent behavioral biases: the overconfidence, the loss aversion, excessive optimism and pessimism and the mimetic behavior, and we compute in the rational analysis the asset trend by means of the moving average computing.

Keywords: financial crisis, behavioral finance, rational behavior, investor's psychology, overconfidence loss aversion, mimetic behavior, multi-agents based simulation

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The robust bi-objectif fractional programming problem

Session Title: *Multiobjective Optimization*

Abstract: This paper introduces a new method for solving the uncertain bi-objectif linear fractional programming problem (ULFP). An ULFP is a linear fractional programming problem with interval coecients in the objective function. We have introduced to the uncertain linear fractional problem two criteria from the robust optimization, the worst case criterion and maximum regret criterion. It is proved that we can convert an ULFP to an optimization problem with interval valued objective function which its bounds are linear fractional functions. Also a discussion for the solutions of this kind of optimization problem is proposed.

Keywords: uncertain Function, Linear Fractional Programming, robust optimization, worst case criterion, max regret criterion

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Optimizing a linear fractional function over the integer efficient set

Session Title: *Multiobjective Optimization*

Abstract: In this article, we develop a new algorithm to solve the problem of optimizing

a linear fractional function over the efficient set of multi-objective integer linear programming problem. Indeed, the branch and bound process strengthened by efficient cuts and tests allow us to fathom considerably nodes in the tree. Thus, a large number of feasible and non efficient solutions can be avoided. An experimental study is reported to validate the theoretical results.

Keywords: Multi-objective optimization, Integer programming, Fractional programming, Branch and cut

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SYSTEM SURVIVABILITY UNDER POISSON ATTACKS: A GAME THEORETIC SETTING WITH SINGLE AND MULTIPLE OBJECTIVES

Session Title: *Multiobjective Optimization*

Abstract: We introduce the concept of system survivability in the context of continuous attacks as the probability that a system under attack will continue operation up to some fixed time t. We define a Poisson attack as an attack on a targeted system that follows a Poisson process. We consider the superposition of Poisson attacks. From the attacker side, we determine the optimal Poisson attack strategy that minimizes the system survivability. We also investigate the least-cost attack. With respect to the defender of the targeted system, we determine the optimal strengthening strategy that maximizes the system survivability under limited defensive resources. Next, we model the problem in a game-theoretic setting. We consider different levels of information availability to each antagonist and use the absence of information on the defensive move as one strategy to mislead the attacker. The defender will have to simultaneously consider hardening the system and making the information available to the attacker as ambiguous as possible to deter attack. The attacker estimation of the intensity of the Poisson attack is performed through a Bayesian updating and the attack is only executed if both such an intensity is found to be sufficiently high and the size of the error to be sufficiently low.

Keywords: defense/attack strategies, system survivability, Poisson processes, continuous attacks, game theory

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Bi-objective modeling of multi-item capacitated lot-sizing problem

Session Title: *Multiobjective Optimization*

Abstract: The purpose of this paper is to develop a bi-objective optimization model for the multi-item capacitated lot-sizing problem with backlogging. The proposed model attempts to minimize simultaneously the total cost and the average inventory level over a finite planning horizon. Since the considered problem is NP-hard, the multi-objective particle swarm optimization is used to find optimal solutions. Numerical examples are developed to illustrate the effectiveness of the model.

Keywords: lot-sizing, production planning, backlogging, multi-objective optimization, MOPSO

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Les déterminants institutionnels et macroéconomiques du développement du marché boursier dans les pays de la région MENA

Session Title: *Financial markets 2*

Abstract: Cet article analyse l'incidence de s déterminants macro-économiques et institutionnels sur le développement du marché boursier. Sur la base des données panel relatives à 14 pays de la région MENA, observés durant la période 2006-2015. Et a la suite, d'utilisation des techniques de variables instrumentales pour montrer de façon plus rigoureuse l'effet des déterminants institutionnelles sur le développement du marché financier (Hall et Jones, 1999 ; Acemoglu, Johnson et Robinson, 2001).

Nous avons obtenus les principaux résultats suivants : les facteurs macro-économiques, tels que le taux d'épargne, le taux d'intérêt et la liquidité du marché boursier sont des déterminants importants du développement du marché boursier. D'ailleurs, les résultats montrent également que le développement institutionnel comme capturé par un indice de risque politique n'est pas un prédicateur important du développement du marché boursier de la région MENA.

Keywords: développement financier, développement institutionnel, technique des variables instrumentales, indice de risque politique, fragmentation ethnique, polarisation ethnique

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KOU JUMP DIFFUSION MODEL: AN APPLICATION TO THE SP 500; NASDAQ 100 AND RUSSELL 2000 INDEX OPTIONS

Session Title: *Financial markets 2*

Abstract: The present research points towards the empirical validation of three options valuation models: a) the ad-hoc Black-Scholes model as proposed by Berkowitz, b) the constant elasticity of variance model, and c) the Kou jump-diffusion model. The analysis has been conducted on 26,974 options negotiated during the year 2007 and written on three indexes, the S&P500, the Nasdaq100 and the Russell2000. The empirical analysis shows the superiority of the jump-diffusion model. Indeed the double-exponential distribution, used by the Kou model, covers three interesting properties that are: a) leptokurtic feature, b) memory-less property and c) psychological aspect of market participants. Despite of these advantages, there are not many empirical studies based on this model partly because option valuation formula is rather complicated. This paper is also the first to have used the technique of nonlinear curve-fitting through the trust-region-reflective algorithm and cross-section options to estimate the structural parameters of Kou model.

Keywords: Jump-diffusion, Kou model, Leptokurtic feature, Trust-region-reflective algorithm, US index options

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Implementing the Mixture of Factor Analyzers In the financial context: Tunisian Exchange rate risk Measurement using VaR.

Session Title: *Financial markets 2*

Abstract:

This article approaches an important question and perpetually renewed: Measuring currency risk related to the Tunisian exchange market.

We suggest studying this question from three daily series TND/USD, TND/EUR and TND/JPY, where we try to study the correlation between them, then to analyze the distribution of their logarithmic returns

over the period from 2006 till 2009. We apply the Mixture of Factor Analyzers to model the future daily yields on these same series. Finally, the comparison of the VaR estimated from the Mixture of Factor Analyzers model, Gaussian Mixture model and the Factor Analysis model shows that the first approach gives VaR forecasts where its observed Violation rates are very close to expected Violation rates (1%, 5% and 10%).

Keywords: Value at risk (VaR), Gaussian Mixture model (GMM), Mixture of Factor Analyzers (MFA), Factor Analysis model(FA), EM algorithm, Monte Carlo Simulations

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L'impact de la révolution Printemps Arabe sur le marché boursier: Validation empirique sur la Tunisie

Session Title: *Financial markets 2*

Abstract: Le marché boursier Tunisien est régit principalement par la Bourse des valeurs mobilières, le Conseil du marché financier, la société interprofessionnelle de Compensation et le fonds de Garantie de marché. En effet, la bourse des Valeurs Mobilières de Tunis BVMT est une entreprise de marché responsable de la gestion , de la sécurité et de la promotion du marché tunisien des valeurs mobilières. Ses actionnaires sont les 26 sociétés intermédiaires en bourse. Ensuite, le conseil du marché financier CMF est un organisme public chargé du contrôle, de la régulation du marché financier et de la protection de l'épargne investi dans les valeurs mobilières. De plus, la société interprofessionnelle de Compensation et de dépôt des valeurs mobilières STICODEVAM dépositaire Central , est chargé du dépôt des valeurs mobilières et de la compensation des opérations boursières. Enfin, le fonds de Garantie de marché FGM est administré par la bourse, garantit la bonne fin des transactions . Il a fonctionné parallèlement avec le nouveau système de cotation électronique. Le nombre des sociétés dont les titres de capital sont admis à la cote de la bourse s'élève actuellement à 77 dont 24 sociétés financières (Banque, Assurance, Société de Leasing…)

Les évènements de décembre 2010 qui ont conduit la Tunisie vers la révolution du 14 janvier ont eu des conséquences sur l'activité du marché financier. Les volumes d'échanges ont baissé de moitié sur le 1er semestre 2011 et les cours des actions, particulièrement les valeurs bancaires, ont fortement chuté. La transition démocratique que vit la Tunisie marque une nouvelle escale pour réformer le climat des affaires, encourager l'initiative privée et défendre la bonne gouvernance. Ces nouveaux défis incitent la Bourse à déployer tous ses efforts pour restaurer la confiance des investisseurs et promouvoir le rôle de la Bourse dans le financement de l'investissement. L'année 2011 restera dans la mémoire des tunisiens comme l'année de la Révolution. Le soulèvement populaire et la chute de l'ancien régime en janvier ont entrainé le pays dans une période d'instabilité politique, financière et économique. La situation s'est abîmée davantage avec le déclenchement de la guerre civile en Libye et l'aggravation de la crise de la dette en Europe. durant cette année le pays a connu sa première récession depuis 25 ans. A la clôture de l'année 2011, le TUNINDEX a terminé sur une performance négative, une première après huit ans de hausses progressives avec une perte de 7,63% en effaçant une partie des gains réalisés en troisième trimestre 2010 (19,13%), et ce compte tenu du contexte particulier connu par la Tunisie tant sur le plan politique qu'économique. Pour la première fois dans son histoire, la Bourse de Tunis a suspendu les cotations pendant une quinzaine de séances et ce, à deux reprises du 17 au 31 janvier et du 28 février au 4 mars, soit au total 15 jours de bourse. Cette mesure exceptionnelle a été prise en combinaison avec les autorités du marché (le Conseil du Marché Financier) et l'Association des Intermédiaires en bourse pour freiner les risques de panique des investisseurs constatés avec le déclenchement des soulèvements populaires et la destitution de l'ancien président Z.A Ben Ali. Durant cette année, le volume global des transactions en bourse a atteint 3 139 millions de dinars contre 3 831 millions de dinars en 2010, marquant une baisse de 18%. En déception d'une conjoncture difficile, le premier trimestre de l'année 2012 a enregistré un léger redressement de l'indice TUNINDEX de 3%. Ces baisses ne doivent cependant pas dissimuler une accélération du rythme des admissions en Bourse. En effet, en 2012, le Conseil d'Administration de la Bourse de Tunis a donné son accord de principe pour l'admission de huit sociétés à la Cote de la Bourse, dont deux ont été accomplies fin 2012. Après un cumul de trois années de baisse consécutive, le Tunindex a atteint 4.33% de chute en 2013. Ce repli est due d'amoindrissement de la confiance des investisseurs, a été principalement attribuable à la situation économique et sociale qu'a traversé la Tunisie en 2013 : apparition du terrorisme, assassinats politiques (Chokri Belaid, Mohamed Brahmi), dégradation de la notation souveraine, instabilité politique, retard de l'ANC à élaborer la constitution, les procédures de changement des gouvernements En 2014, le Tunindex a enfin retrouvé le chemin de la hausse (1.87%). La conjoncture économique a pourtant été difficile en 2014. Le

soulagement politique consécutive à l'achèvement du processus provisoire qui a contribué à animer le marché et à nourrir des espoirs, n'a pas apaisé les inquiétudes nées des déséquilibres macroéconomiques du pays. En 2015, le marché boursier tunisien a connu des moments difficiles et une forte volatilité. Des aléas de tous genres, externes et internes ont fragilisé les indices qui se sont appréciés au premier semestre et même battu leur plus haut atteint au 30 septembre 2010, pour prendre au deuxième semestre une voie totalement inverse. Notre travail de recherche consiste à déterminer l'impact des événements liés à la révolution sur le marché boursier Tunisien. Pour atteindre notre objectif, nous avons étudié le rendement journalier de l'indice boursier Tunindex sur une période allant de 10 décembre 2010 jusqu'à 31 mars 2016. pour constituer notre base de donnée nous avons fait recours à plusieurs sources de données tels que la Banque Centrale Tunisienne BCT, la Bourse des Valeurs Mobilières BVMT, le Conseil de marché financier CMF. Les dates des actes terroristes sont revérifiées avec la base des données Global Terrorism Database. les variables de contrôle étudiées sont collectées a partir de Data Stream. Nous cherchons à travers cette étude à vérifier si le marché boursier Tunisien réagit négativement aux évènements politiques. de même, nous proposons d'étudier la sensibilité de l'indice Tunindex aux attaques terroriste post-révolution. On se demande également, si les élections influencent positivement le rendement de l'indice boursier. Pour répondre à nos questions de recherche, nous avons effectué des régressions en Moindre Carré Ordinaire des rendements journaliers (Rindex) sur des différents événements postrévolution (attaques terroristes, les élections, les changement de gouvernements, des événements positifs…) et prenant compte de Taux de change, l'indice CAC, des variables macroéconomique comme variables de contrôle. Les résultats que nous avons obtenus indiquent que:

- l'effet négatif du terrorisme en période d'instabilité est plus important qu'en période de la stabilité politique. En effet, le rendement boursier baisse à raison de 1.65% en présence d'un gouvernement transitoire, tandis qu'il diminue que de 0.63% en présence d'un gouvernement avec un mandat de 5 ans. Ce résultat peut être expliqué qu'en période d'instabilité caractérisée par une incertitude, les conflits politiques amplifient la méfiance et l'aversion des individus. Ce qui engendre systématiquement un climat d'incertitude et aura par conséquence un impact sur le comportement de l'investisseur qui se répercute négativement sur l'indice boursier (Christos et Stephanos (2014a) et Ki-ktos et al (2014)). Les attaques terroristes ont favorisé un climat économique très défavorable et décourageant aux investissements, ce qui explique la sensibilité de l'indice boursier TUNIDEX durant la période post révolution.

- le changement du gouvernement ont un effet significatif positif sur le rendement de la bourse en période de crise politique.

- Le coefficient de la variable relative aux interviews politique était significativement négatif ce qui nous a surpris. Cela nous conduit à conclure que les interviews des chefs d'Etat n'ont pas atteint leur objectif au contraire ils ont aggravé la situation de la bourse en période d'instabilité politique.

Nous terminons cette partie par l'estimation de l'effet des élections présidentielles et législatives sur le marché boursier. Ceci montre que l'incertitude diminue suite à la constitution d'un état gouverné, ce qui nous permet de conclure que les élections sont favorablement accueillies par le marché. Cette étude offre une contribution en étant la première recherche, à notre connaissance, à traiter l'effet de la révolution de printemps arabe sur le marché boursier Tunisien (les événements terroristes, les élections…). Cette étude peut dégager d'autre résultats plus explicites en utilisant d'autre modèles économétriques tels que le Garch.

Keywords: Printemps Arabe, Marché boursier, Tunisie

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Design of a telecommunication ring access network

Session Title: *Decision and IT*

Abstract: We consider the ring design of an access telecommunication network to minimize the capacity of the wavelength involved in carrying the data while accommodating a traffic matrix. We provide a new model based on a time staged formulation. This model has a polynomial size of O(n^2) permitting the resolution of realistic networks on a commercial solver. The preliminary computational results show the effectiveness of our model as it outperforms the commonly used arc-node flow formulation, which size is O(n^3).

Keywords: Ring design, compact formulation, time staged, multi-commodity flows, telecommunication

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Optimization and Evaluation of Voice Quality in VoIP

Session Title: *Decision and IT*

Abstract: VoIP or Voice over IP is a voice communication technology rapidly emerging. Voice, data and video are among the key issues of telecommunications today. In this paper we describe the various services provided by this technology, technical evaluation of voice quality based on the packet loss rate, delay, jitter. Also, we discuss the viability of using the methods of processing the speech signal affected by noise using optimization algorithms to improve the quality and intelligibility.

Keywords: VOIP, audio quality, voice quality, signal processing, optimization

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The Challenge of integrating Workflow Technology in Quality management Practice: Customer Complaints Management as a Case

Session Title: *Decision and IT*

Abstract: This paper consists of building up a workflow mechanism which is capable of introducing time, responsibility and reliability dimensions in order to comply with normative requirements of quality management in terms of continuous improvement of the organization meeting customer satisfaction.

The current paper aims at improving specific design processes pertaining to an operational Information system 'IS' in such a way to construct new ones based primarily upon the four steps of the Deming cycle.

Specifications of workflow scenarios have been defined via BPMN for customer complaint processes as well as the treatment of its non-conformities.

In fact, the major problems of a company do not generally result from the individual's mistake or error but rather from a bad organization. Reducing the defaults can be considered as a challenge to be accomplished. Managers must do their best in order to further enhance the organization to hinder defaults.

Our research consists of building up a workflow mechanism aiming to further valorize the notion of Customer complaint yet considered with so weak a usage by organizations.

Companies that have worked out a valuable management strategy of customer focus and the treatment of their complaints achieve interesting results in terms of customer satisfaction, as well as of the improvement of Supply chain performance.

Nowadays, companies can also increase their reactivity via competitive information and using Information and communication technologies 'ICT' such as Workflows so as to enhance their 'IS' performance and to ensure a better satisfaction of customers.

Keywords: Information and Communication Technology 'ICT', Information System 'IS', Workflow, Business Process Reengineering 'BPR', Business Process Management 'BPM', Business Process Modeling Notation 'BPMN', Workflow Management System 'WFMS'

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A Decision Aid System for Omani medical herb leaves recognition using computer vision and artificial intelligence

Session Title: *Decision and IT*

Abstract: Herbs have been widely used in food preparation, medicine and cosmetic industry. Knowing which herbs to be used would be very critical in these applications. Nevertheless, the current way of identification and determination of the types of herbs is still being done manually and prone to human error. Designing a convenient and automatic recognition system of herbs species is essential since this will improve herb species classification efficiency. Plant has plenty use in foodstuff, medicine and

industry. And it is also vitally important for environmental protection. However, it is an important and difficult task to recognize plant species on earth.

This research focus on recognition approach to the shape and texture features of the herbs leaves. It aims to realize the computerized method to classify the herbs plants in a very convenient way. Portable herb leaves recognition system through image and data processing techniques is implemented as automated herb plant classification system. It will be an Open Source System designed especially for helping scientist in agricultural field.

The proposed system employs adaptive neural networks algorithm and image processing techniques to perform recognition on a number of species of herbs.

Keywords: Image processing, Decision aid system, Medical herbs, Neural network, Android, iOS

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Une nouvelle approche d'évaluation et de classement des ressources humaines selon les compétences et les préférences

Session Title: *Decision Models in Human Resource Management and Marketing*

Abstract: La gestion des ressources humaines s'impose comme l'un des points clé de la compétitivité des entreprises. L'utilisation efficace de leurs compétences s'avère indispensable à la satisfaction des objectifs de performance imposés. Ainsi, les dirigeants des entreprises se trouvent accorder un intérêt croissant à la satisfaction des besoins de ces ressources qui permet d'entrainer une nette amélioration de la qualité de leur rendement et donc, des performances au processus d'entreprise. Nous nous intéressons à travers cet article de fournir aux dirigeants des entreprises un outil d'aide à la décision pour l'évaluation et le classement des ressources humaines selon les compétences et les préférences. Pour ce faire, nous proposons une nouvelle approche composée de trois étapes. La première étape concerne l'identification et l'évaluation des compétences acquises par chaque ressource humaine et

requises par chaque tâche en utilisant la méthode 2-tuple. Ainsi, La deuxième étape représente le calcul d'un coefficient de proximité entre les compétences acquises et requises en utilisant la méthode multicritère TOPSIS (Technique for Order by Similarity to Ideal Solution).

Enfin la troisième étape concerne le classement des ressources humaines pour chaque tâche en utilisant la méthode SMART (Simple Multi-Attribute Rating Technique)

Keywords: Problème d'affectation, Compétence, Préférence

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The Crowdfunding: Analyses of the impacts of the determinants of motivation contributors to fund projects on Crowdfunding platforms

Session Title: *Decision Models in Human Resource Management and Marketing*

Abstract: Crowdfunding mediated through the use of computers is a new paradigm used by individuals to solicit funds from others to complete projects.

In this article, we present the preliminary results of an exploratory qualitative study in the near 32 experts. modeling was used by the cognitive maps by performing a structural analysis of the impacts of the determinants of contributors motivation for projects on crowdfunding platforms by MICMAC method. This research emphasizes

the importance of instrumental motivation crowdfunding as the key variable and motivation of efficiency and quality assurance motivation as variables relay on crowdfunding platforms.

In addition to the anticipated extrinsic motivations, such as obtaining funds (creators) and consumer products and experiences (donors), our preliminary results suggest that

people are also motivated to participate because of social interactions realized through crowdfunding platforms. Social interactions include strengthening the commitment to an idea through feedback (creators) and feelings of belonging to a community with interests and ideals (donor) similar.

Keywords: Crowdfunding, Entrepreneurs, Donors

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Embodied Virtual Agents (EVA): Why are they not more numerous?

Session Title: *Decision Models in Human Resource Management and Marketing*

Abstract: In spite of a very optimistic academic and professional literature, embodied virtual agents on commercial Web sites do not seem to keep all their promises. While the efficiency from certain companies' point of view seems undeniable, the update, in December 2009, of a benchmark led by OrangeLab in 2007 on 36 embodied agents present on French Web sites, reveals that more than 60 % of them had disappeared. This raises an essential question: why are not the embodied virtual agents more numerous? This research deals with understanding the disappearance of virtual sales agents through a series of in-depth interviews with consumers. It also identifies the main consumers' expectations towards the interactive embodied agents in the context of a commercial web site.

Keywords: Virtual sales agents, commercial web sites, consumer behavior

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A multi-SOM application for Market Segmentation

Session Title: *Decision Models in Human Resource Management and Marketing*

Abstract: Market segmentation is a widely used activity in marketing research. It's used to improve customer satisfaction and to achieve maximum profit. But, it is still a crucial problem in the interpretation of the quality of the segments. In the literature, different methods were used in Market segmentation like k-means, Self-organizing map, etc.

We studied and compared the concepts of market segmentation and cluster analysis and their different criteria.

This paper applies the multi-SOM approach for market segmentation in retail banking to determine the optimal number of segments using different clustering criteria.

Keywords: Market segmentation, Cluster Analysis, segment, multi-SOM

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Extension of the hesitant fuzzy linguistic term sets

Session Title: *Decision and Fuzziness*

Abstract: Multicriteria decision-making methods are considered as efficient tools to solve decision problems allowing DMs to better deal with uncertainty, complexity, and conflicting objectives. In order to evaluate alternatives more appropriately, we should consider not only quantitative criteria but also qualitative ones which are evaluated by multiple DMs or experts according to their judgments. However, these judgments are affected by past experience, vague and imprecise knowledge or subjective cognition. Thus, DMs may have vague knowledge about the preference degree of one alternative over another, in which each evaluated preference value cannot be precisely specified but can be expressed with linguistic terms.

Herrera and Martinez [2000] showed an inadequacy of the fuzzy linguistic approach. Instead of it, they expressed the linguistic information by means of couples composed by a linguistic term and a numeric value. So, they developed a computational technique for computing with words without any loss of information which is the 2-tuple fuzzy linguistic representation model.

In many real decision making problem, usually, due to time pressure and lack of knowledge or data, or the limitation of DMs information processing capacities, DMs cannot give their preference with single exact term but several possible terms. Therefore, the emerging of the concept of hesitant fuzzy linguistic term sets (HFLTSs) proposed by Rodriguez et al. [2012], which allows the membership degrees of an element to a given set to have few different terms. Thus, the new concept provides a more direct description of these DMs opinions.

However, under GDM situations, evaluation information provided by different experts may have an obvious difference. Introduction of HFLTSs could overcome this problem, because they avoid performing

data aggregation and can directly reflect differences of different experts' opinions since their computational models is facilitated by means of Computing with Words (CW) processes.

Additionally, different computational functions for HFLTS are introduced, and it is then shown how the use of HFLTS can improve the elicitation of linguistic information by using the fuzzy linguistic approach and context-free grammars.

This is a crucial point, because it allows experts the use of different comparative linguistic expressions to represent experts' knowledge/preferences in decision making.

Recently, Liu and Rodriguèz [2014] have proposed a new representation of the hesitant fuzzy linguistic term sets dealing with linguistic intervals based on new fuzzy envelope through a fuzzy membership function achieved on the one hand by the several linguistic terms making up the HFLTS and an another hand aggregated by using the OWA operator.

In this work, the OWA operator will be replaced by the TOCIA operator (Hajlaoui et al. [2016]) in order to reorder all linguistic arguments and accurate a fuzzy measure for the ordered position. Subsequently, the developed extension of the hesitant fuzzy linguistic term sets will be compared with representation model of Liu and Rodriguèz [2014].

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Hajlaoui Sonia, Halouani Nesrin, Chabchoub Habib . (2016) Development of some linguistic aggregation operators with conservation of interaction between criteria and their application in multiple attribute group decision problems. TOP. Online publication date: 14-Mar-2016.

Keywords: uncertainty, hesitant fuzzy linguistic term sets, TOCIA operator, Multicriteria decision-making methods

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Hesitant Fuzzy Reliable Quality Function Deployment

Session Title: *Decision and Fuzziness*

Abstract: In many situations, information cannot be assessed precisely in a quantitative form but may be in a qualitative one, and thus, the use of a linguistic approach is necessary [2]. This approach allows managing situations in which experts hesitate between several values to assess an indicator, alternative, variable, etc.

The concept of Hesitant fuzzy sets (HFSs), introduced by Torra [3], has been considered as an extension of fuzzy sets, for imprecise preferences. It allows expressing hesitation, doubt, or indecision during a decision process. Hesitant situations are very common in various decision making problems. Hence, HFSs have attracted the attention of many researchers since it facilitates the management of uncertainty motivated by hesitation.

Rodríguez et al. [4] applied the HFLTS to linguistic multi-criteria decision making (L-MCDM) in which experts provide their evaluations by linguistic expressions based on comparative terms, such as "between very low and medium", or by simple linguistic terms, such as "very low; low; medium; high; very high". Liao and Xu [5] applied VIKOR method with hesitant fuzzy sets. They used hesitant normalized Manhattan distance to calculate the group utility measure, the individual regret measure and the compromise solution. In there study, they evaluated the service quality of domestic airlines with the proposed approach and obtained hesitant fuzzy group utility measures, hesitant fuzzy individual regrets and hesitant fuzzy compromise solutions for alternatives.

In this paper, the concept of a hesitant fuzzy linguistic term set (HFSs) is introduced to support a linguistic and computational basis to enhance the richness of linguistic extraction based on the fuzzy linguistic approach.

A real world application of the Hesitant fuzzy Reliable Quality Function Deployment (RQFD [6]) method is illustrated through dialysis service of Tunisia healthcare sector. In the first step, a decision making team is constructed from academicians taking place in this research, patients are invited to give their preferences. Afterwards, a group of doctors which will take part in our study, is determined. They have the opportunity to think of several linguistic terms at the same time or to look for a more complex linguistic terms that are not defined in the initial linguistic term set.

Keywords: Hesitant fuzzy sets, Decision making, RQFD

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Decision risk analysis through fuzzy multi-segment programming

Session Title: *Decision and Fuzziness*

Abstract: Supported by a great number of researches, the goal programming (GP) has been, and still is, the most widely used approach for solving multiple objective decision making (MODM) problems. In this paper, we will present a fuzzy multi-segment programming (FMSP) model for dealing with a high level of uncertainty decision making problems by providing the following main contributions: the first is to extend the classical fuzzy programming (FP) techniques in order to enable it to solve a wide range of uncertainties decision making problems (i.e., the fuzzy multi segment or coefficient cases that which cannot be solved by current FP techniques), and the second is that of the proposed method was constructed based on the recent development in FP area, which it can deal with all types of fuzzy goals in real world problems. Finally, a numerical example provided to illustrate the effectiveness of the proposed model.

Keywords: Fuzzy programming, Goal programming, Multiple objective decision making, Fuzzy multi-segment programming

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Interrelationships among manipulabilities of fuzzy social choice functions

Session Title: *Decision and Fuzziness*

Abstract: The purpose of this paper is to establish the link among the dierent manipulability concepts when the fuzzy preference relations belong to a common domain. The attention is focused on the set of fuzzy preference relations that are connected, reflexive, and max-min transitive. This paper provides for the concepts of "l-manipulability" (l = 1; 2; 3) proposed by Ben Abdelaziz et al. (2008) some equivalent and implication relations

Keywords: Fuzzy social choice functions, Manipulation, Fuzzy preference order

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A Greedy Chemical Reaction Optimization for Flexible Job Shop Scheduling Problem

Session Title: *Scheduling Problem Decisions 1*

Abstract: The Flexible Job shop Scheduling Problem (FJSP) is an extension of classical job shop scheduling problem such that each operation can be processed on different machine and its processing time depends on the used machine. This paper proposes a new Greedy Chemical Reaction Optimization (GCRO—FJSP) algorithm with greedy algorithm to solve the FJSP in order to minimize the maximum completion time (Makespan). Experiments are performed on benchmark instances proposed in the literature to evaluate the performance of our algorithm.

Keywords: Scheduling, Flexible Job shop Scheduling Problem, Chemical Reaction Optimization, Greedy Algorithm, Decision Making

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A Bio Inspired Algorithm For Solving Distributed Job Shop Scheduling Problems In Muli-Factories

Session Title: *Scheduling Problem Decisions 1*

Abstract: Distributed Job shop Scheduling problem is one of the well-known hardest combinatorial optimization problems since it is an extension from the classical single-factory job shop. In this paper, we focus on the resolution of the Distributed Job shop Scheduling (DJS) problem in order to minimize the makespan. In the first step, we aim to find an effective way to assign jobs to factories in such a way to have an equilibrated workload between all the factories. In the second step, we will try to solve the Distributed Job shop Scheduling problem using a bio-inspired algorithm which is Ant Colony Optimization. Experiments are conducted to evaluate the performance of our proposed algorithm.

Keywords: Distributed Scheduling, Job shop, Decision Making, Ant Colony Optimization

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Scheduling for a reconfigurable manufacturing systems

Session Title: *Scheduling Problem Decisions 1*

Abstract: Manufacturing systems are reflected to rapid changes in response to market fluctuations. We distinguished two main types of Manufacturing Systems, Dedicated Manufacturing Lines DML which are based on high capacity and low variety of products and flexible manufacturing systems FMS which are designed to produce a large variety of products on the same system but with a high cost of machine implementation. In 2000, reconfigurable manufacturing systems RMS appeared to ensure an adjustable flexibility with high productivity and ability to react quickly to fluctuations. The RMS is designed for changes in its production capacity and in its functionality, it offers an adjustable capacity and the ability to adapt to the required functionality when they are needed. The choice of tools for modeling industrial systems is based on the internal and external industrial environment. In this note, we adopt Petri nets as RMS modeling tools. Petri nets are one of mathematical modeling language and graphical tools used for analysis of discrete event systems given their modeling of synchronization, parallelism, conflict and shared resources. They have been widely used in industrial applications and flexible manufacturing systems, however their use in the RMS is limited. Scheduling function depends heavily on the

manufacturing system concerned, then the RMS is characterized by scalability which is the ability to change the maximum production capacity by adding new lines to existing machines. RMS is also characterized by the machine-level integrability which is the ability to add new machines incorporating new features via handling systems. To the best of the authors' knowledge, Few works have studied the scheduling function and taking into account the specificities of the RMS which distinguish it from other manufacturing systems. In fact, methods and management approaches previously developed by DML and FMS need to be reviewed, adapted or replaced in order to include these new specificities. In this perspective there is a need to develop new approaches based on Petri nets and studying scheduling function by taking into account the reconfigurability of the system. Our approach is applicable to resource allocation problem in a job shop scheduling. The goal is to analyze the impact of the choice of the shop-floor architecture reconfiguration on minimizing the makespan for scheduling problem, and this in order to improve the makespan. This paper propose an approach based on labeled Petri nets with minimizing the number of installed machines for a job shop scheduling problem with multiple machines. We calculate the minimum initial marking allowing the firing of at least one sequence transitions consistent with the observed label. This marking correspond to the minimum total number of tokens. In other words, the minimum number of machines needed to perform all operations of different jobs. We also develop a mathematical model for the job shop scheduling problem to optimize the makespan with availability constraint. Then, we prove that the minimum initial marking estimation is the best solution from the side of resources optimization where all operations of all jobs can be directly done with no-wait and from the other side of optimization the total completion time of scheduling. Finally, we evaluate the total cost generated by the choice of the shop-floor architecture so that the decision maker will be able to choose according to their preferences.

Keywords: reconfigurable manufacturing system, job shop scheduling, initial marking estimation, labled Petri Nets, shop-floor architecture

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Flexible Job shop problem with sequence-dependent setup time and learning effects

Session Title: *Scheduling Problem Decisions 1*

Abstract: Generally, for the most classical scheduling problems, job processing times are assumed to be known and constant over time. However, this assumption is not appropriate for many realistic situations where the employees and the machines execute the same task in a repetitive manner. They learn how to perform more efficiently. As a result, the processing time of a given job is shorter if it is scheduled later, rather than earlier in the sequence. Early empirical studies have shown that learning effects have a significant impact on manufacturing systems. However, only in last decades, this phenomenon has been considered in connection with scheduling problems. In this paper, we propose a genetic algorithm (GA) for solving the flexible job shop problem (FJSP) with two kinds of constraints, namely, the sequence-dependent setup times (SDST) and the learning effects. Makespan is specified as the objective function to be minimized. Experimental studies are presented to assess and validate the benefit of the incorporation of the learning process to the SDST-FJSP over the original problem.

Keywords: Learning effects, Flexible job-shop problem, sequence-dependent setup times, Genetic algorithms

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A PTAS for the Maximum Lateness Open Shop Problem on a Fixed Number of Machines

Session Title: *Scheduling Problem Decisions 1*

Abstract: In this paper we consider the open shop scheduling problem where the jobs have delivery times. The minimization criterion is the maximum lateness of the jobs. This problem is knwon to be NP-hard, even restricted to only 2 machines. We establish that any list scheduling algorithm has a performance ratio of 2. For a fixed number of machines, we design a polynomial time approximation scheme (PTAS) which represents the best possible result due to the strong NP-hardness of the

problem.

Keywords: Scheduling, Open Shop, Maximum Lateness, Approximation, PTAS

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Role of Banks in The Governance of Non-Financial Firms: Evidence from Europe

Session Title: *Corporate governance 2*

Abstract: The aim of our research is to investigate the important role of banks in the governance of the listed companies belonging to the Euronext100 index. Mainly, this research seeks to examine the impact of the bank's presence within the firm, as a creditor or shareholder, on firm performance, the motivations of banks to acquire holdings and whether the presence of the bank as a shareholder of the firm facilitates its access to bank loans. Empirical analyses are conducted from a sample of 86 listed non-financial institutions belonging to the Euronext100 index over the period 2008–2013 using the Three-Stage Least Squares method. The study shows at first, that the presence of the bank within the firm, as creditor or shareholder, is positively related with firm performance. Moreover, the firm's performance is an important determinant of the presence of the bank shareholding. Finally, the presence of bank as shareholder of the firm does not facilitate its access to bank loans.

Keywords: Corporate governance, Bank debt, Bank ownership, Performance, Euronext100, Simultaneous equation model

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Intellectual capital disclosures and corporate governance: An empirical study of non-family vs. family firms in France

Session Title: *Corporate governance 2*

Abstract: Intellectual capital is increasingly recognized as having much greater significance in creating and maintaining competitive advantage and shareholder's value. This paper aims to investigate the intellectual capital disclosures (ICD) of French firms in corporate annual reports in 2011. We distinguish between family and nonfamily firms. The findings, based on multiple regressions models for the family and nonfamily firms, indicate that corporate governance mechanisms influence differently ICD in overall as well as its three subcategories. For family firms, board meetings proxy is negatively associated with the level of IC disclosure. CEO duality is negatively associated with both ICD and structural capital disclosure but not with the two other IC subcategories (human capital and relational capital). Regarding nonfamily firms, the findings confirm those of the extant literature. Board independence, board size, number of board meetings and the percentage of directors' attendance to board meetings are positively associated with the extent of ICD.

Keywords: Intellectual capital, corporate disclosures, family firms, corporate governance

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CSR DISCLOSURE and COUNTRY-LEVEL INSTITUTIONAL DIFFERENCES: AN INTERNATIONAL COMPARATIVE ANALYSIS

Session Title: *Corporate governance 2*

Abstract: The main purpose of the current paper is to examine the impact of country-level corporate governance (CG) and legal system, on corporate social responsibility disclosure (CSRD). Our analysis tends to evaluate to which extent they have endured the global financial crisis (GFC), as reflected in the CSR disclosure of listed firms.

The present study explores whether CSRD practices, are similar or different in organizations from six countries and two different continents corresponding to two different legal systems, corporate governance systems, and accounting models. These factors, amongst others, may influence the disclosure policy of CSR information. Our results uncovered that a CSR transparency-increasing effect of

country-level corporate governance is more pronounced for firms in Anglo-American legal and regulatory environment, and less pronounced for firms in Euro-Continental institutional environment.

Keywords: Country-Level, Corporate Governance, Legal System, CSR Disclosure, Euro-Continental Context, Anglo-American Context, Global Financial Crisis

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Determinants of Agency Costs of Equity: new evidence from French context

Session Title: *Corporate governance 2*

Abstract: In this paper, we analyze the determinants of agency conflicts between shareholders and managers via the recent theories and practices of agency costs. In the empirical investigation, we conduct tests on the French companies in order to examine the impact of the main factors that can intensify the conflicts between shareholders and managers.

According to the empirical results, age of the leader, the dual functions of the CEO and president of the Board as well as the discrepancy between ownership and voting rights are relevant determinants of equity agency conflicts. Furthermore, we find that, the leadership seniority and his ownership constitute internal governance mechanisms for French companies.

Keywords: Agency costs, Entrenchment, Ownership structure, Governance

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New hybrid linear programming models using both quantitative and qualitative criteria for ABC Multi-Criteria Inventory Classification

Session Title: *Applications of Multiple Criteria Decision Aid 2*

Abstract: in this research work, two linear hybrid weighted optimization models using both quantitative and qualitative criteria for ABC Multi-Criteria Inventory Classification are presented. The proposed models combine the usefulness of two

well-known weighted optimization models from the literature. The first model uses only criteria of quantitative type. Whereas, the second model is an extension of the first model and includes both quantitative and qualitative criteria. The proposed models are tested through different normalization methods and the impact of the normalization method on the final inventory classification is shown. To prove the performance of the proposed optimization models with respect to some existing models, a benchmark data set from a Hospital Respiratory

Therapy Unit (HRTU) is used. A comparative study is also established based on a service-cost analysis to highlight the effectiveness of our proposed models.

Keywords: Multi-Criteria Inventory Classification, Linear programming, Quantitative criteria, Qualitative criteria, Normalization method,Service-cost analysis

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The Analytic Hierarchy Process: a multicriteria classification method in the medical decision making

Session Title: *Applications of Multiple Criteria Decision Aid 2*

Abstract: This paper presents a multi-criteria classification method applied in the biomedical field, to deal with more precisely the breast cancers classification. As early detection is crucial, an efficient and fast system that can determine whether a mass in breast is cancerous is, hence, in dire need. Besides, breast cancers can be categorized on the basis of different schemes. In this work, we adopt a classification depending on stage of cancer. This scheme performs based on six significant criteria that positively impacts the classification of patients, and serves a purpose of facilitating and optimizing the selection of the best treatment according to the type of the tumor. Therefore, an Analytic Hierarchy Process (AHP) decision making method is used but not in a conventional way. The utilized procedure

provides a score for each patient based on the defined criteria for ranking the severity of the patient's cancer stage. The pair-wise comparisons is used to estimate the relative weights of each criteria. The final decision about the type of tumors is then derived based on the deduced score.

Keywords: multicriteria decision making, AHP, breast cancer, classification

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Multi-criteria approach for the performance evaluation of industrial purchase: the case of a company of Furniture Manufacture

Session Title: *Applications of Multiple Criteria Decision Aid 2*

Abstract: In a context of Strong competition and increasing globalization, the companies today expect from the purchase a contribution to their competitiveness by reducing costs, the detection of innovations, the continuous search for flexibility and reactivity and mastering quality. Indeed, the purchasing function has become a strategic lever and its impact on the company's performance is significant. Moreover, the leaders were conscientious of the performance assessment of Purchase in order to detect the causes of malfunction, to remedy them and therefore improve the overall performance of the company. However, performance control of Purchase is traditionally based on the financial aspects which are not satisfactory to account for the overall performance and detect the sources of malfunctions. Thus, in this research we have the ambition of developing a new methodology to facilitate the evaluation of the performance of the Purchase, having as targets to move from a sense of control and finding to a sense of anticipation, of piloting and from a mono-criterion evaluation of performance to a multi-criteria performance.

The first difficulty encountered during the evaluation is the complexity of Purchasing. Thus, it is very difficult to identify the reasons on which we can act to improve the performance. It is clear that a prioritization of the purchasing is crucial to detect its sources of non-performance and to identify the process indicators of the Purchasing performance. Correspondingly, we will adopt a methodology based on the SCOR in order to model the Purchase in a hierarchical description on different levels of processes that constitute it and to identify a complete mapping of action variables allowing the assessment of the

multi-criteria performance of Purchasing. Therefore we will classify the purchasing process into five macro-processes which will then be decomposed into detail levels. This structuring methodology enables us to map holistically the different action levers for every sub process. Thus, for each evaluation object we will identify a set of indicators.

Furthermore, the prioritization of the purchasing generates a very heterogeneous set of indicators. Hence, the question that arises is how to aggregate these indicators, which are different in nature. This is the whole issue of multi-criteria and multi-level evaluation to be raised. Indeed, multi-criteria methods of decision support provide an answer to properly conduct this work. Our choice focused on the method PROMETHEE method essentially because his philosophy seems to be adapted to our issue. Thus, while being simple, this multi-criteria method allows assessing the performance of the purchasing on the basis of several non-commensurable indicators.

Finally this approach is applied to an industrial context in a furniture manufacturing group. The obtained results show that the purchase of this group is generally not effective. The sources of non-performance are due to malfunctions at the sub-process levels 1 and 3 i.e. the levels of flexibility, reactivity, innovation and marketing-Purchase.

Keywords: Industrial Purchase,Performance, Multi-criteria evaluation, Promethee

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A new hybrid approach for multi-criteria inventory classification using Differential Evolution and Topsis

Session Title: *Applications of Multiple Criteria Decision Aid 2*

Abstract: During the last decades, many companies have taken seriously the task to manage efficiently the inventory because of the surplus of stock and the need to make more profits for the financial and logistical well-being of the companies. For this purpose, the ABC classification is one of the most frequently analysis used in production and inventory management domains, in order to classify a set of

items in three predefined classes A, B and C, where each class follows a specific management and control policies. In this paper, we present a new hybrid approach for the ABC multi-criteria inventory classification problem using the evolutionary algorithm namely the Differential Evolution (DE) with the multi-criteria decision making method Topsis. This hybrid approach starts by generating a set of solutions (weights criteria) via the Differential Evolution algorithm within certain constraints of the problem. These solutions will be individually used subsequently by the Topsis method as an input parameters in order to generate a score for each item and thereafter establish a total ranking items based on the descending order of scores. Once the items ranked, we use the most studied and used ABC distribution in the literature (20%-30%-50%), which consists of dispatching the first 20% items with higher score in class A, the next 30% items with higher score in class B and the remaining items with the worst scores in class C (50% of total items). To evaluate objectively the performance of our proposed model, an estimation function based on the inventory cost and the fill rate service level is used, and also represents the objective function of our approach DE-Topsis, which consist of minimizing the inventory cost. To this end, we consider a widely used data set from the literature provided by an Hospital Respiratory Therapy Unit (HRTU), which contains 47 inventory items evaluated on three criteria: Annual Dollar Usage (ADU), Average Unit Cost (AUC) and Lead Time (LT). The aims of our proposed approach is not solely to classify the inventory items based on objective weights, but especially to exploit the robustness and usefulness of both DE and Topsis methods, to reduce the inventory cost, to provide acceptable performance and to comply with the constraints of the ABC MCIC problem. Based on generated results, a comparative study was conducted to compare our proposed hybrid model with other ABC classification models of the literature. We established that the proposed model enables more accurate classification of inventory items and better inventory management cost effectiveness for the ABC multi-criteria inventory classifiation problem.

Keywords: ABC multi-criteria inventory classification, Differential Evolution, Topsis

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Effectuation: Impact on R&D project Performance within Innovation

Session Title: *Corporate finance*

Abstract: Innovation is a major issue in the development of organisations who aim to achieve competitive advantage. Some companies find difficulties to adapt appropriate approaches in an innovative climate. To solve this dilemma, effectual logic seems to be particularly suitable for treating the context of R&D. To capture the partucularities of effectual approach in R&D projects, this study adopts a quantitative methodology containing 80 R&D projects. The outcomes shows that effectuation successfully treat R&D projects characterized by innovation through the significant contribution of the four dimensions in explaining R&D project performance in Tunisia. In general, this study shifts the effectual logic from her native discipline entrepreneurship to the context of R&D, capture its peculiarities and checks its effect on performance.

Keywords: Effectuation, R&D projects, Performance, Decision making

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EARNINGS MANAGEMENT DECISION BASED ON GAME THEORY

Session Title: *Corporate finance*

Abstract: Earnings management widely studied through positive accounting theory. We stand out from this theory to propose another theoretical and methodological approach of this. In the paper, the earnings management decision is analyzed in view of the game theory and based on Principal-Agent model implementation. The theoretical results show that a named contract under the Principal-Agent is an alternative arrangement to provide best solutions to the earnings management decision.

Keywords: Earnings management, agency theory, Game theory

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The effect Financial Reporting Quality on Corporate Investment Efficiency:Evidence from the Tunisian Stock Market

Session Title: *Corporate finance*

Abstract: Positive Accounting Theory (Watts and Zimmerman, 1978),stipulates that financial reporting has two dimensions: market signaling and monitoring managerial behaviors. Through these signaling and stewardship means, a better financial reporting quality would have significant economic consequences in terms of efficient resources allocation, which results in improving firms' investment decision. In this paper, we examine the impact of financial reporting quality on corporate investment efficiency. Our sample is based on 25 Tunisian listed companies for the period 1997-2013. The findings confirm that some characteristics of the financial information, namely, reliability and smoothness, appear to increase the investment inefficiency, while others, i.e., conservatism and relevance, seem have no significant effect on investment decisions. We attribute such results mainly to the contextual specificities of the Tunisian environment, such as, the institutional bodies and settings, the cultural values and some characteristics of the corporate governance system.

Keywords: Financial Reporting Quality, overinvestment, underinvestment, information asymmetry, agency costs, emerging market

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The Modigliani-Miller Capital Structure Irrelevance Theorem with less restrictive assumptions

Session Title: *Corporate finance*

Abstract: This paper aims to re-examine the Modigliani-Miller (MM) capital structure irrelevance theorem with less restrictive assumptions. We will show that it is possible to verify the MM swing activities and approve the neutrality of capital structure when we relax assumptions related to arbitrage proposition without : (i) homemade hypothesis,(ii) unlevered firms, (iii) full earning hypothesis, (iv) the same corporate and personal debt interest rate , (v) the absence corporate and personal taxes.

Keywords: Modigliani-Miller theorem, Capital structure, Debt, Interest rate

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A Review and perspectives on Control charting with 3D scanned data

Session Title: *Statistical Decision Making and Statistical Analysis*

Abstract: 3D laser scanners are being increasingly used in industries due to their ability to provide information on product geometry, surface defects, surface finish, and numerous other product characteristics that can reflect the overall quality, not only dimensional information. There are several applications of control charting schemes to high density dimensional data which aim to detect changes in the process and interpret an out-of-control signal to improve the surveillance. In this paper, we review Control charts that have been proposed for monitoring 3D scanned data in industrial applications and in some other applications and we discuss their advantages and disadvantages in some cases regarding their use.

Keywords: 3D laser scanner, high-density data, Profile Monitoring, Statistical Process Control, Phase II control charts

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A Control Chart For Monitoring Image Data and Providing Both Spatial and Temporal Diagnostic Information

Session Title: *Statistical Decision Making and Statistical Analysis*

Abstract: Big Data offers an opportunity to find new insight in statistical process control (SPC) methods and surveillance because it can be served as a basis for innovative solutions in industry, healthcare and science. According to the variety of data, data can be presented in the format of videos, music and

images. We are interested in the high level of data that images can provide. The majority of applications of control charts for these high-dimensional image data has been focused on either

detecting the fault time or the spatial information of the fault. In this paper, we are interested on monitoring image data using a control chart that provide both spatial and temporal aspects.

Keywords: Image-Based Monitoring, image data, profile monitoring, statistical process control, spatial control chart

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ANOVA and Regression as Powerful Tools in Engineering: Some Practical Examples

Session Title: *Statistical Decision Making and Statistical Analysis*

Abstract: While trying to solve a faced problem or provide an explanation for an observed phenomenon, engineers may find themselves overwhelmed by a huge amount of data from sampling real or virtual environments. Statistical analysis allows systematic processing of these data to generate reduced-order analytical models relating variables of interest. This enables simple interpretation of the data, predictions, and improvement of processes or products. Statistical analysis tools include regression, ANOVA (analysis of variance), time series analysis, factor analysis, correlation, and response surface methodology (RSM) [1]. In this work, we aim at showing successful examples from recent research works that utilized both the regression and ANOVA tools to construct useful models for civil, mechanical, and architectural engineers. These models can be used in making efficient and innovative design decisions by practitioners in the field.

In statistical contexts, regression refers to any method that tries to quantify the relationship between one or more independent variables (predictors) and a dependent variable through fitting a model to collected data. The objective of regression is either describing the relationship among the variables, or forecasting values beyond the observed collection. Common regression models are the linear, polynomial, and logistic. ANOVA indirectly compares the means of more than two samples through processing sets of variances. Estimates of cause-based variation (between the samples) and chance-

based variation (within the samples) are found separately and compared using an F-test, based on which a conclusion can be drawn about the potential cause, whether intentionally applied or merely hypothesized. ANOVA also helps deciding whether samples should or not be treated statistically different (e.g., by applying a separate regression model to each).

We start with the study of Arhin et al. [2], carried out in the busy urban area of Washington DC in the USA, which used multiple linear regression (through the ordinary least squares method) to better understand the factors that would affect the total bus stop time (TBST) in seconds, defined as the sum of dwell time, which is the time elapsed between opening and closing the doors for passengers, and the time a bus takes to effectively park at a bus stop and then to re-enter the traffic stream. The sampled data for that study were collected at 60 bus stops that have high patronage in 2014 on weekdays during selected peak periods: morning (7 a.m. to 10 a.m.), mid-day (12 p.m. to 2:30 p.m.) and evening (4 p.m. to 6 p.m.). The field data were collected manually by the participating team. The predictors were the dwell time in seconds (Dt), the number of passengers boarding (Pb), the presence of street parking (Pk), the number of approach lanes (Ln), the bus pad length in inches (Bp), and the number of passengers alighting (Pa). The model thus has the general form of

TBST= D_t k_1+ P_b k_2+ P_k k_3+ L_n k_4+ B_p k_5+ P_a k_6+ ε (1)

Six regression models were developed because the data were split into a 2×3 array, with 3 choices for the time of the day (morning, mid-day, evening) and 2 choices for the bus stops location (at intersections, mid-block). The statistical significance was verified by the ANOVA tests (p-value < 0.05). The proposed models can be used by civil engineers to improve bus scheduling in similar urban areas.

The next example we chose is based on a recent study in the UK [3]. With more and more emphasis on curbing energy consumption and the inevitable greenhouse gas emissions in modern societies, this study used statistical analysis to support housing downsizing (moving to a smaller dwelling) as a proposed means for reducing residential energy consumption. Downsizing of equipment (e.g., heaters and air conditioning units) to save energy has already received earlier attention, whereas engineers should realize the energy saving from smaller living spaces and avoiding under-occupancy. The total sample size was N = 991 households (part of the Energy Follow-Up Survey 2011, commissioned by the UK Department of Energy and Climate Change and the English Housing Survey 2011/2012). Outliers in terms of annual energy consumption were eliminated (those with ±3 standard deviations from the sample mean). Also, households using fuels other than gas or electricity for heating were eliminated to avoid having underrepresented subsamples. Linear regression analysis tested the impact of different

predictors on (log-transformed) annual residential energy consumption. These predictors included the household size and the floor area. Logistic regression was also used to predict householders who under-occupy their homes, with under-occupancy coded as '1' and non under-occupancy coded as '0'. The predictors included the residency period in years, presence of a sick or disabled person in the household, employment status, age of the household reference person, presence of dependent children, ethnic origin, and tenure (e.g., rented or owned). ANOVA was used when selecting the subsample of households, to show the impact of the numbers of bedrooms. The quantitative analysis provided strong support for a large potential for energy saving at national level by promoting downsizing. This work is of special value to architectural engineers, and to a lesser extent to mechanical engineers who are concerned with residential energy systems.

Keywords: Regression, ANOVA, Statistical Analysis, Engineering, Modeling

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Sales forecasting and coal mining planning in the context of hard coal production strategies

Session Title: *Statistical Decision Making and Statistical Analysis*

Abstract: Mining companies in Poland are operating under tremendous uncertainty of turbulent environment. The authors presented methods to facilitate the creation and selection of optimal company production strategy. These methods were scenario planning and forecasting, which are characterized by the greatest degree of fitting. They were optimal for the Polish mining industry. The article also contains factors affecting the demand for coal in Poland.

The article presents also possible to apply coal production strategies and the method of evaluation and selection of optimal strategy in the real, difficult conditions of Polish mining companies' environment. This makes it possible to take a decision burdened with minor errors and less risk.

Keywords: coal production strategies, forecasting, scenario planning, decision making in production

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Simulated Annealing for the Uncapacitated Exam Scheduling Problem

Session Title: *Metaheuristic for Decision Aid-2*

Abstract: Examination Timetabling Problem (ETTP) is a difficult repetitive administrative procedure for large academic institutions worldwide. Creating timetables becomes much more complicated due to the increasing number of students, offered courses and the large number of constraints that have

to be accommodated. These constraints vary from one institution to another in terms of both the type and their importance. In term of complexity, this problem is considered as an NP-hard real world problem for which there is unlikely to be an effective method for finding the optimal solution in a very economically time.

ETTP can be defined as the process of assignment of a set of exams, each taken by a set of students, in a limited number of available timeslots (periods), subject satisfying a defined set of hard and soft constraints. Hard constraints must be completely satisfied in order to obtain a feasible timetable. Soft constraints can be broken but the main objective is to find a solution that satisfies them as much as possible. The measure of the timetable quality is calculated based upon an objective function which represents the degree of soft constraints violation.

A wide variety of approaches have been proposed and discussed for solving the ETTP. In our proposed approach, using a simple graph coloring heuristic we construct a feasible timetable to start

with. Simulated Annealing is then used as an iterative heuristic for improving the spreading of the conflicting exams. Our results on the Toronto benchmark dataset show that our approach provides good results, and turns out competitive with eight recent existing methods.

Future extensions will investigate ways to improve our work and specially reduce the runtime using a parallel execution framework that permit the use of more neighborhood structures and give to the exploration and the exploitation process more time to get better quality of final solutions.

Keywords: Metaheuristics, Simulated annealing, Uncapacitated exam scheduling

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Towards fair rosters' construction: proposed meta-heuristics for solving the aircrew rostering problem

Session Title: *Metaheuristic for Decision Aid-2*

Abstract: The aircrew scheduling problem is extensively investigated in the operations research's literature. It belongs to the NP-hard combinatorial optimization problems. Typically, this problem involves two fundamental phases:An aircrew pairing problem and an aircrew rostering problem. The former consists of generating a set of pairings (rotations or duties) from planned flight segments/legs.The latter focuses on the crew members' needs through maximizing their satisfaction while constructing their individual rosters. In this paper, our main goal consists of constructing final fair rosters while optimizing three objectives: layover, the destinations' number of occurrences and the flight hours per flight crew member. The three objectives are aggregated using weights defined by the decision maker. As the problem complexity is NP-hard, we propose two well-adapted meta-heuristics to solve the aircrew rostering problem: a genetic algorithm and a variable neighborhood search. An extensive computational study is conducted. We first compare the proposed meta-heuristics with optimal solutions obtained by Cplex, using data of the real case of the Tunisian national airline company TunisAir. We then randomly generate large instances by varying the number of crew members and rotations. The obtained results demonstrate the efficiency of our proposed methods.

Keywords: Aircrew rostering problem, Meta-heuristics, Genetic algorithm, variable neighborhood search, Exact method

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A Genetic Algorithm Based Decision Support System for the Petrol Station Replenishment Problem

Session Title: *Metaheuristic for Decision Aid-2*

Abstract: In this paper, we propose a Genetic Algorithm (GA) for solving the Petrol Station

Replenishment Problem (PSRP) within the supply chain. We consider the petrol scenario distribution of dierent types petroleum products of a set of geographically spread stations faced by a petrol industry. The main objective of the delivery process is to minimize the total traveled distance by the used fleet of homogeneous tank-trucks. Given such inputs, the minimization of thetotal traveled distance is subject to assignment and routing constraints that express the capacity limitations of each truck's compartment and the pathways' restrictions. The performance of the proposed algorithm is highlighted through the implementation of a decision support system (DSS). We compare the ability of the proposed algorithm with the exact solution using Cplex and against the best existing results in the literature.

Keywords: Petrol station replenishment, Petrol supply chain, Genetic algorithm, Decision support system

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A hybrid Metaheuristic Approach for the Multi-Objective Heterogeneous Node Placement Problem

Session Title: *Metaheuristic for Decision Aid-2*

Abstract: In this research, we study a multi-objective heterogeneous node placement problem (MO-HNPP) that focuses on the optimal placement and connection between different deployed technologies on the network while including geographical constraints and a free space path-loss model. It consists in selecting the location, number and devices to extend existing networks infrastructure.

The planning phase of such networks usually takes into consideration the following presets: i) a set of candidate sites to locate the potential placement of nodes, ii) the traffic distribution estimated by using empirical prediction models and iii) the signal quality propagation model. The main purpose is then to select the optimal sites for the nodes and the optimal way to establish the connection between them. In

addition, other aspects need to be taken into account as an existing network infrastructure, cost, signal quality and service coverage.

In the MO-HNPP, we focus on resolving the two main aspects of the network planning: providing satisfactory service coverage and ensuring a lowest financial cost. These two conflictual objectives always exist when planning a cellular network services. In this study, we consider not only cellular network infrastructure but heterogeneous existing networks that we lead to extend the coverage in order to ensure a good quality of information transfer between the different technologies. To this end, two more aspects of the network planning are addressed: maximizing information flow to avoid network congestion and minimizing the noise level while connecting different networks.

To the NP-Hardness of the proposed formulation, a hybrid variable length genetic algorithm (HVLGA) is developed to solve the proposed problem formulation. This metaheuristic integrates the local search component of the adapted multi-objective variable neighborhood search approach (AMO-VNS) approach to the multi-objective variable-length genetic algorithm (VLGA) since both algorithms gave promising results while applied to similar problems. The empirical validation well illustrates the performance of the VHLGA using the Inform Lab simulation environment while applied to the maritime surveillance real case study. A set of experiments are performed to highlights the effectiveness of both single-objective (SO) and multi-objective (MO) HVLGA. We then compare the ability of the proposed algorithm with a multi--objective model from the literature in order to validate its effectiveness in dealing with heterogeneous components. The results show that our proposed model well fits the network architecture constraints with a better balance between the objectives applied to the surveillance problem

Keywords: Heterogeneous Network Planning, Hybrid Variable–Length Genetic Algorithm, Multi-Objective Optimization, Node placement Problem

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Hierarchical modeling and solving approach for the Home Health Care Scheduling Problem

Session Title: *Scheduling Problem Decisions 2*

Abstract: The Home Health Care Scheduling Problem (HCSP) is an optimization problem representing an emerging approach for delivering health care services. Home health care consists of assigning a set of caregivers or nurses to provide

health service to patients at their home. Nowadays, such kind of services are highly requested due to the increasing of number of elderly peoples who need to be treated at their homes. Moreover, the HCSP solution will lead to decrease the usage of hospital facilities and the may be used to accommodate more critical cases. Additionally, some patients need long life treatment that should be provided periodically by skilled personnel without a need to go to hospitals. The HCSP was extensively studied and a variety of approaches were proposed for modeling and solving [1]. In this paper, we present a new approach to solve the HCSP. We propose a hierarchical model of the home health care scheduling problem that consists of dividing the problem into a set of interconnected sub problems easier to solve. The obtained model is a result of the application of the Hierarchical Modeling Approach proposed in [2]. The HCSP hierarchical model will be solved using different algorithms to solve each sub problem at each level respecting the type of inter-connection between them. In the next sections, we detail the proposed approaches for modelling and solving the HCSP.

Keywords: Hierarchical Optimization Framework, Hierarchical Directed Acyclic Graph, Objective based Decomposition Strategy, Semantic Decomposition Strategy, Constraint Relaxation Decomposition Strategy, Data Partitioning Strategy

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The Variable neighborhood search for the job shop scheduling problem

Session Title: *Scheduling Problem Decisions 2*

Abstract: In many industries, the scheduling is considered as the most important task, such as project based scheduling, crew scheduling, flight scheduling, machine scheduling, etc.

In the machine scheduling environment, the job shop scheduling problems are considered to be important and highly complex, in which they are characterized as NP-hard.

Our work aims to minimize the late work criterion in the job shop scheduling environment with non-preemptive jobs.

Keywords: Job shop, Late work criteria, Variable neighborhood search VNS, Due Dates

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Decision Support System for the Open-Shop Scheduling problem

Session Title: *Scheduling Problem Decisions 2*

Abstract: In this study, we propose a new Decision Support System DSS for the Open Shop Scheduling problem (OSSP). For the resolution, we used an evolutionary algorithm with dedicated procedure which combines the dierent operators: selection, crossover and mutation.

Keywords: Decision Support System DSS, open shop problem, sum coloring problem.

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A multi-attribute utility based classification for law-project-dynamic scheduling at the Tunisian Parliament

Session Title: *Scheduling Problem Decisions 2*

Abstract: We propose a classification system based on multi-attribute utility to approach an efficient dynamic schedule of law projects at the Tunisian parliament. The adopted attributes are the priority

level of the topic, the time elapsed since the submission of the project, and the size evaluated in terms of number of articles within the project. The outcomes of the multi-attribute utility represent classification scores for the schedule; which is dynamic due to the stochastic arrivals of new projects and the effect of extended duration of waiting projects. The schedule is periodically updated. The priority levels are essentially preemptive projects, projects with strategic priority, and projects with low priority. A survey is designed specifically to identify those topics that are unanimously considered as of strategic priority by a representative sample from the members of the parliament.

Keywords: Multi-attribute utility, Classification, Scheduling

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Principal agent model of Earnings and Tax management relationship

Session Title: *Decision Aid in Accounting and Auditing*

Abstract: The purpose of this study is to analyze the relationship between shareholders and managers when managing earnings and tax. We use bi-level bi-objective model to compute the different possible situations. Our aim is to determine the decision of the manager when he is faced to two conflicting objectives: maximizing financial income and minimizing taxable income. We address this situation within a principal-agent game between shareholders and managers. We consider also two other players: tax authorities and auditors. We then, propose optimum decision variables of both: shareholders and the manager that preserve their interests.

Keywords: Earnings management, Tax management, Manager compensation scheme, Game theory.

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Cultural Tightness-Looseness and Fraud Acceptance

Session Title: *Decision Aid in Accounting and Auditing*

Abstract: Although insurance fraud is a universal issue and exists in many European countries, attitude towards insurance fraud and perceived risk of being caught could differ significantly across countries as they are strongly correlated with the tightness-looseness dimension of culture (Triandis, 1996).

Drawing on Gelfand et al. (2011)'s theory of tight and loose cultures, we theorize that perceived wrongness of insurance fraud, fraud occurrence and perceived risk of being caught depend on the cultural tightness (i.e. the extent to which a country is characterized by strong social norms and low tolerance for deviant behaviors).

We specifically investigate these differences across two fairly different European countries—Norway (i.e. tight culture) and Ukraine (i.e. loose culture). Using field data from a global European Social Survey (ESS), we compared responses of two samples of respondents from Norway and Ukraine. Findings suggest that consumers from tight culture report less tolerance for insurance fraud (inflating insurance claim), are less likely to commit an insurance fraud, and perceive higher level of risk of being caught than their counterparts from loose culture (Ukraine). Understanding cultural variability in attitude towards insurance fraud, willingness to defraud, and sensitivity to the risk of being caught could enrich our knowledge about how to prevent insurance fraud. Cultural differences in fraud acceptance are emphasized throughout the main body of the discussion. The paper concludes with salient issues for future research.

Keywords: Culture, Tight, Loose, Insurance Fraud

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Psychological Reactance in the auditee's behaviors

Session Title: *Decision Aid in Accounting and Auditing*

Abstract: The relations of control within an organization can caused negative and contrary behaviors from the controlled being able to damage the efficiency of the made controls and its performances.

Theses behaviors can be explained by the theory of Psychological Reactance introduced by Brehm, (1966). The objective of this research is to identify the auditor client (hereafter auditee) behaviors which can reduce audit quality. Conducting both an observation and an interview approach within 25 auditors and 19 accounting and financial directors, we identified 13 auditees' behaviors that may reduce either the auditor competence or independence or both competence and independence.

Keywords: Audit quality, competence, independence, auditor client relationship, auditees's behaviors

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The Effects of Mandatory IFRS Adoption and Audit Quality on Accounting Quality in Europe: Conditional Conservatism

Session Title: *Decision Aid in Accounting and Auditing*

Abstract: The purposes of this study are to examine the impact of the mandatory International Financial Reporting Standards (IFRS) adoption in 2005 by European firms on the level of accounting conservatism, a feature of earnings quality, and the way large audit firms (Big 4) moderate these effects. We study the effect of mandatory IFRS adoption on accounting conservatism defined using Basu's (1997) asymmetric timeliness measure and with a modified version of the Khan and Watts (2009) measure (C_Score). The samples obtain from listed firms from 10 European countries, eight code-law European countries and two common-law European countries, that mandatorily adopted IFRS over the period 1994-2014.

The main findings are that: 1) conditional conservatism, as proxied by the asymmetric timeliness of bad vs. good news, has decreased after the adoption of IFRS overall and in many countries. 2) audit quality further complements the beneficial impact of IFRS since those companies that are audited by the Big-4 multinational audit firms exhibit lower levels of accounting quality compared to their non-Big-4 counterparts, with simultaneous increase (decrease) in good (bad) news timeliness.

Overall, we document that the variety among deep-rooted institutional factors and legal settings within Europe disappear after mandatory IFRS adoption.

Keywords: IFRS, Conditional Conservatism, accounting quality, Big 4 audits, Code Law, Common Law, European Union

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Pouvoir du dirigeant, attributs du conseil d'administration et profil de risque à long terme de l'acquéreur: Cas du secteur bancaire en Europe

Session Title: *Corporate governance 3*

Abstract: Abstract

Our research analyzes how the manager authority and board of directors' attributes affects the long term risk profile of acquiring banks. For a sample of 66 European acquiring banks our results show that, on average, bank mergers does not significantly affect the risk profile of the acquiring bank. However, we found that the combination of functions and the presence of women in the board of directors negatively affect the evolution of the risk profile of the acquiring bank, while managerial ownership and board size variables have a positive effect.

Keywords: European banks M&A, Long term risk profile, Manager authority, board of directors' attributes

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CEO Inside Debt and Labor Investment Efficiency

Session Title: *Corporate governance 3*

Abstract: In this paper, we investigate how CEO inside debt (pension benefits and deferred compensation) affects labor investment efficiency. Using a sample of 4932 U.S firms-year observations

over the period 2006-2013, we find that abnormal net hiring, measured as the absolute deviation from net hiring predicted by economic fundamentals is negatively associated with CEO inside debt. These results are robust to using an alternative proxy of CEO inside debt and when we control for endogeneity issues. We further examine under-investment (under-hiring and over-firing) and over-investment (over-hiring and under-firing) problems and provide evidence that each particular type of labor inefficiency declines as CEO inside debt increases. We also show that the positive impact of CEO inside debt on labor investment efficiency is more pronounced in firms facing higher financial constraints. Overall, our findings highlight the importance of CEO inside debt for firm-level employment decisions.

Keywords: Inside debt, pension, deferred compensation, Investment efficiency, Labor investment

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Relation gouvernance-innovation et son impact sur la performance des PME

Session Title: *Corporate governance 3*

Abstract: Several studies showed that the innovation is a collective process, resulting from multiple interactions established between actors of various natures. Nevertheless, the innovation implementation is difficult. Consequently, defining principles of corporate governance which are able to stimulate the process of innovation become a major debate. Our objective of this work consists in studying the role of the corporate-governance system on the development of innovation. The study will relate to the industry sector in the Tunisian context. The tests statistical carried out on a sample of 22 Tunisian companies show that the IPO, the composition of the board of administration and the system of reward and incentive company plays a significant role in the dynamism of innovation. Our results show, also, that the participation of stakeholders and organizational learning can influence the level of innovation. While the relation of performance to the corporate governance of innovates young companies is not yet checked.

Keywords: Corporate governance, shareholder approach, stakeholders approach, cognitive theory, institutional environment, organizational learning, innovation, performance

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The study of relationships between ownership structure and voluntary disclosure in Tunisian Stock Exchange

Session Title: *Corporate governance 3*

Abstract: This study reports on voluntary disclosure practices of Tunsian companies listed in Tunisian Stock Exchange (TSE) during the period 2009-2013, and relates the extent of disclosure voluntary to : ownership concentration, institutional ownership and family control. A disclosure index has been developed and statistical analysis is performed using regression analysis. three hypotheses are tested using data collecte from 2009 to 2013 annual reports. The results indicated that Institutional ownership and ownership concentration have a positive association with voluntary disclosure level in annual reports, however, Family control do not have any significant relation with voluntary disclosure level.

Keywords: Voluntary disclosure, ownership concentration, institutional ownership, family control, Tunisian stock exchange

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