

Welcome to IFORS 2014, Welcome to ICORD

From the IFORS President, Nelson Maculan



This 2014, IFORS celebrates its 55th year in Barcelona during the Triennial IFORS Conference. For the first time, this will be preceded by the International Conference on OR for Development (ICORD).

These are two of the major activities that showcase IFORS efforts at promoting and developing the discipline as well as improving links among its member societies. IFORS 2014 marks the 20th Triennial conference of bringing OR professionals and enthusiasts together.



For more than 20 years, ICORD has effectively provided a venue for people involved and working in the area of OR for development to network. IFORS commitment to help propagate the use of OR for development has had a long history. ICORD 2014, along with other initiatives of the

Developing Countries Committee, continues this tradition. ICORD precedes the Barcelona conference.

Preparations for these two conferences are well under way and I wish to personally invite you to celebrate IFORS 55th year with us! 🌐



www.ifors2014.org

From the IFORS 2014 Organizing Committee Chair, Elena Fernandez



The three-year preparation time for a long-awaited event has borne fruit - over 2600 registered participants, 2300 accepted abstracts, four top level plenary speakers and 630 parallel sessions grouped in nearly 160 streams have kept Program Chair Stefan Nickel very busy. The local organizing committee has set a wonderful scientific program. It is not too late to make plans to come!

On the other hand, if you are all set - let me be the first to say, **Benvinguts a Barcelona!** As you arrive, here are some tips. If you are flying, there are frequent buses to Barcelona city center from the airport, which cost 5.9 euro per trip (<http://www.aerobusbcn.com>). They connect both terminal T1 and terminal T2 to the city center (Plaça de Catalunya) and are colored blue. If you are staying in the conference area you then have to continue the trip by taking the metro (yellow line L4 to El Maresme-Forum stop) or a taxi for not more than 35 euro.

If time allows, you may want to explore the city. I think that the public transportation system around the city is quite good and safe. If you take a T10 card with 10 tickets, you will be able to make combinations of metro, bus and tram in the same trip. Taxis abound, are reliable and charge reasonable rates. >>

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>> Different things to see and do for different tastes abound. The gothic quarter close to Las Ramblas, including the Born area at the other side of Via Laietana, with plenty of bars and restaurants, is a good place to wander around. In the well-known fresh-food markets of La Boqueria or Santa Caterina are places for a tasty light lunch. If you prefer to stay closer to the conference area, you may enjoy tapas and seafood in many of the restaurants of the Olympic Port and, specially, in the Barceloneta.

Remember that we eat quite late, particularly in summer when it is warm and days are long. Usual lunchtime is 14h and dinner not before 21h. Of course, many places start offering food a lot earlier. In any case, do not miss the opportunity of having some tapas and drinks in a terrace.

Enjoy Barcelona from the very first moment. Every corner has a pleasant surprise in store for you! 🌐

From the ICORD 2014 Local Organizing Committee, Lluís Miquel Plà-Aragonès

International Conference on OR for Development, ICORD 2014

The Art of Modeling, the Challenges of Implementation



July 10-11, 2014 @ University of Lleida, Catalonia, Spain
(immediately preceding
IFORS 2014 July 13-18)



2013 Rome ICORD

There is still time to come and attend ICORD 2014! I am waiting to welcome you at the University of Lleida, Catalonia, accessible by a 1-hour train ride from Barcelona or 2-hours from Madrid. ICORD 2014 will again be hosted by IFORS in co-operation with the EWG ORD.



From the Editor

IFORS@55: Wider Network, Closer Links

The IFORS community is excitedly awaiting the events of the coming month, the 20th IFORS Triennial Conference and the 2014 ICORD. This will be a great opportunity to meet new friends, renew connections, learn from others, and share one's expertise. It is also a significant milestone for IFORS which marks its 55th year of bringing an increasingly wider network of OR people all over the world closer together.



For most, opportunities to go to meetings are limited. Thus the IFORS News, specifically for this issue, allows you to peek into the activities, conferences and meetings in Aveiro, Porto, Munich, Manila, Semnan, Dublin, and Andhra Pradesh. Much of the coverage comes from our IFORS Correspondents, who, starting with this issue, will be distinguished by their IFORS Correspondent seal. Not all the member societies have nominated their correspondents – and I urge you to submit your correspondents now, so that we may hear from your societies more!

It is also through the IFORS Correspondents that we are able to hear from the societies for our regular column on OR Society in Focus. This issue features the OR Society of South Africa. Further south, we hear about a very successful application of OR from the New Zealand Post, highlighted in this issue's OR Impact. This OR showcase project was delivered by a group of OR consultants. How do they go about their consulting work? The tutorial portion includes a beginners guide to OR consulting, which we hope will be useful to people out there trying their hands at consulting work for the first time. Another useful tool for Analytics is featured here. Lastly, the contribution of OR to the body of work in the area of humanitarian logistics is tackled in the Book Review.

I hope that this issue continues to help link everyone and cater to the varying interests of the community. Do let me know what you think! 🌐

Elise del Rosario <elise.del.rosario@stepforward.ph>

International Transactions in Operations Research (ITOR)

Editor: Celso Ribeiro <celso@ic.uff.br>

Call for Papers: “Improving Healthcare: New Challenges, New Approaches”

Guest Editors: Joana Dias (INESCC/FEUC, Portugal), Humberto Rocha (INESCC, Portugal), and Ana Viana (ISEP/INESC TEC, Portugal)

The **International Transactions in Operational Research (ITOR)** will publish a special issue dedicated to “Improving Healthcare: new challenges, new approaches”.

Recent advances in medicine allow us to live longer and healthier lives. These advances have been made possible through the joint contribution of very different scientific fields. Healthcare is nowadays better understood as a multidisciplinary field, with increasing number of challenges that can be better tackled by joint collaboration of researchers with different scientific backgrounds. Operational Research can significantly contribute to tackle many of the current and forthcoming challenges.

Contributions solicited cover a variety of topics, including but not limited to:

- Location and allocation problems in healthcare,
- Healthcare logistics,
- Planning and scheduling healthcare delivery,
- Optimization in radiotherapy,
- Healthcare information systems,
- Medical data mining,
- Health economics - costing and pricing of health services,
- Disease modelling, e

- Risk assessment and prioritisation.

Although we strongly encourage the submission of papers presented at the **XXXI Euro Mini Conference on Improving Healthcare** that will take place in Coimbra, Portugal, from March 30 to April 1, 2015, this Call for Papers is also open to the entire community of academics and practitioners.

All papers will be peer-reviewed according to the editorial policy of **ITOR** (<http://www3.interscience.wiley.com/journal/118505725/home>), published by the International Federation of Operational Research Societies (IFORS). Papers should be original, unpublished, and not currently under consideration for publication elsewhere. They should be prepared according to the instructions to authors that can be found in the journal homepage. Authors should upload their contributions using the submission site <http://mc.manuscriptcentral.com/itor>, indicating in their cover letter that the paper is intended for this special issue.

The deadline for submissions is June 30, 2015. Other inquiries should be sent directly to any of the Guest Editors in charge of this issue: Joana Dias (joana@fe.uc.pt), Humberto Rocha (hrocha@mat.uc.pt), and Ana Viana (aviana@inescporto.pt). 



CONFERENCES

Conference on Dynamics, Games and Science (DGS): Distinctly Golden and Scholarly

Ricardo Cruz <rpmcruz@fc.up.pt>, Alberto Pinto <aapinto@fc.up.pt>,  Gerhard-Wilhelm Weber <gweber@metu.edu.tr>

Porto played host for the first time to the Portugal-based International Conference on Dynamics, Games and Science <http://www.fc.up.pt/dgsiii/> (DGSIII) last February 17 to 21. Preceded by the 2008 and 2013 DGS, this conference was also the 50th birthday celebration of Alberto A. Pinto.

DGS III was attended by people from the research and academic community, including MSc and PhD students. It featured 25 plenary talks and 18 thematic sessions, followed by a *Pedro Nunes Lecture* by Charles Pugh. The thematic session had 3 to 6 participants, including PhD and postdoctoral students. The thematic sessions were dedicated to one of the following themes: Artificial Intelligence, Data Analysis, Dynamical Systems, Game Theory, Mathematical Finance, Optimization and Stochastic Optimal Control, and its applications to such areas as Biology, Economics, Engineering, Energy, Natural Resources and Social Sciences.

Plenary talks were given by: O. Hernandez-Lerma, *Dynamic Potential Games*; D. Pinheiro, *A Renormalization Scheme For*



The Focal Decompositions Of A Family Of Mechanical Systems; A. Yannacopoulos, *Optimal Control in Space and Time and the Management of Environmental Resources*; A.A. López, *A Model Of Optimal Allocation Of A Fixed Production Under Uncertainty*; A.A. Pinto, *Price Competition In The Hotelling Model With Uncertainty On Costs*; C. Baesens, *Chaotic Breathing*; J.F. Oliveira, *2D Rectangular Cutting and Packing Problems - An Overview*; M. Faias, *Stability In Price Competition And Incomplete Information*; J. Gama, *Evolving Data, Evolving Models*; R. MacKay, *Dynamic Pricing Of Electricity*; R. Amir, *Network Effects, Market Structure and Industry Performance*; C. Braumann, *Stochastic Differential Equation Models For Growth And Harvesting In Randomly Varying Environments*; F. Riedel, *Ellsberg Games - Games Theory under Knightian Uncertainty*; D. Zilberman & I. Labouriau, *Dynamics Near Heteroclinic Networks*; P. Hernandez, *Leadership And Peer Effects In A Heterogenous Organization*; T. Machado, *Fractional Dynamical Systems*, N. Stollenwerk: *Chaos And Noise In Population Dynamics*, *Modelling And Data Analysis In Complex Systems*; J.M. Pacheco, *Climate Change Governance, Cooperation and Self-organization*; J. Renault,

Dynamic Sender-Receiver Games; R. Jeltsch, *Simulation Of Complex Time Dependent Processes*; S. van Strien, *Some Interesting Dynamics Associated To Games: Properties Of Fictitious Play*; J. Martins, *Vaccination Strategies In The SIRI Model*; E. Accinelli, *Evolution, Crisis and General Equilibrium*; and C. Pugh, *A Geometric Approach To The Landau-Ramanujan Function Of Some Diophantine Equations*.

Various thematic sessions with their organizers follow: I. Pereira, *Bayesian Statistics*; E. Pimentel, *Dispersive Equations And Mean-Field Models*; D.F.M. Torres, *Dynamic Equations on Time Scales*; F.S. Leite and L. Machado, *Optimization and Dynamical Systems on Manifolds*; J. Becker, *Applied Game Theory*; J. Gama, *Data Sciences*; J.F. Oliveira, *Applications of Operations Research in Industry and Services*; A.A. López, *Micro And Macroeconomic Implications Of Some Dynamic Models*; B. Oliveira, *Oligopoly Theory*; J.P. Almeida, *Dynamics, Computation and Combinatorics*; R. Soeiro, *Dynamics*, R. Cruz: *Dynamic Games*; D. Mendes and V. Mendes, *Nonlinear Time Series Models Applied To Economics*; O. Gomes, *Knowledge Discovery*; A.M. Rosa and J.M.C. Correia, *Philosophy Science and Social Science*; C. Ramos, *Complexity And Nonlinear Dynamics*; S. Fernandes, *Fluid Dynamics and Numerical Semigroups*; and L. Silva, *Statistical And Mathematical Models In Plant Ecology And Forestry*.

Alberto Pinto (University of Porto, Portugal), Carlos Alberto Aragão de Carvalho (CNPEM, Brazil), David Rand (University of Warwick, UK), David Zilberman (University of California, USA), Gerhard-Wilhelm Weber (METU, Turkey), João Gama (INESC TEC, Portugal), Mauricio

Peixoto (IMPA, Brazil), Michel Benaïm (University of Neuchatel, Switzerland), and Saber Elaydi (Trinity University, USA) comprised the scientific committee.

Sponsoring the conference was the Laboratory of Artificial Intelligence and Decision Support unit of the Institute for Systems and Computer Engineering (LIAAD-INESC TEC), the Foundation for Science and Research (FCT), the University of Porto, and the International Center of Mathematics (CIM). Participants were invited to submit survey/expository papers of their presentations to a volume to be published by Springer, "Modeling, Dynamics, Optimization and Bioeconomics II", edited by Alberto Pinto and David Zilberman. This volume will be based on peer reviewed selected works presented in this conference and in the *Berkeley Bioeconomy Conference 2014*. The first volume featured a letter by Gerhard-Wilhelm Weber.

Weber credits A.A. Pinto (who celebrated his golden anniversary), his school, and students for the huge success of DGSIII, as follows: "Professor Pinto established this school, research tradition and conferences series as a center of excellence and as forum of vivid exchange on recent deep findings and their current and future applications. From the very beginning, Professor Pinto has been committed to responding to Operational Research challenges and contributing to their solution, as well as inviting members of his school and his world-wide network of colleagues and friends to fruitfully serve in the international family of OR, EURO, and IFORS." 

Optimization in the Natural Sciences: Aveiro Hosts 30th Mini Euro Conference

Tatiana Tchemisova <tatiana@ua.pt>, Adelaide Freitas <adelaide@ua.pt>,

Alexander Plakhov <plakhov@ua.pt>,  Gerhard-Wilhelm Weber <gweber@metu.edu.tr>

Hosted by the University of Aveiro, Portugal, the XXX EURO mini conference on "Optimization in the Natural Sciences" (MEC XXX) was held from February 5 to 9 through the support of the Association of European Operations Research Societies (EURO) and EURO Working Group on Continuous Optimization (EUROPT).

Conference topics reflected the diversity of operations research applications in the natural sciences, to wit: analysis of micro array data or next generation sequencing; applications of modeling and optimization in physics, biology, chemistry, and medicine; billiard theory and applications; biomedical engineering; design optimization; data visualization for optimal decisions; image processing and inverse problems; infinite and semi-infinite optimization with applications; multi-criteria optimization with applications; optimal control applied to biological models; optimization in bioinformatics and computational biology; shape optimization; and statistical and probabilistic modeling.



The organizational duties were distributed among an International Program Committee, the local Organizing Committee and three conference co-chairs, Adelaide Freitas, Alexander Plakhov and Tatiana Tchemisova.

The Scientific Program included six plenary talks: *Multi-Dimensional*



Markov Chains with Special Structures of Generators and their Applications In Natural Sciences by Alexander Dudin (Belarusian State University), *Optimal Potentials for Schrödinger Operators* by Giuseppe Buttazzo (University of Pisa, Italy), *Variational Problems of Plastic Surgery* by Georgi Smirnov (University of Minho, Portugal), *The Tracks Geometry, Menzin's Conjecture, Continuous and Discrete Bicycle Transformation and Complete Integrability* by Sergei Tabachnikov (Pennsylvania State University, USA), *Some New Problems in Optimization Theory* by Leonid Bunimovich (Georgia Institute of Technology, USA), and *Compositional Data Analysis, Correspondence Analysis, and the Log-ratio Connection* by Michael Greenacre (Universitat Pompeu Fabra, Spain). Two tutorial lectures, *Deterministic Lipschitz Global Optimization and Infinity Computer and Numerical Computations with Infinities and Infinitesimals*, were given by Yaroslav Sergeyev (University of Calabria, Italy).

More than 70 contributed talks comprised the 22 sessions divided into the 3 streams of Optimization and Applications, Dynamical systems, and Statistics, Bioinformatics and Health Sciences. About 90 authors presented their results, with total attendance from 21 countries of four continents reaching 100.

The Organizing Committee from the Mathematics Department of the University of Aveiro offered the participants an interesting social program. This included a guided visit to the house-museum of outstanding Portuguese neurologist, researcher, teacher, writer, 1949 Nobel Prize winner Egas Moniz, considered the forerunner of modern brain imaging techniques and psychosurgery. >>

>>The house-museum, designed by the famous Portuguese architect Korrody in 1915 as well as the neighboring Quinta do Marinho are themselves places of interest. An excursion to RAIZ, a private non-profit institute of forestry research situated in beautiful Quinta de São Francisco and a visit to the exposition of the Science Center "Fabrica" were the other highlights of the social program.

It will be recalled that MEC XXX is the 30th event in the series started in 1984 by EURO. Among the latest editions are MEC XXIX - Graz-2013, Austria (October 17-19, 2013), MEC XXVIII - Herceg Novi, Montenegro 2012 (October 4-7, 2012), MEC XXVII - Nottingham, UK 2012 (September 13-15, 2012), MEC XXVI- Poznan, Poland 2011 (September 6-9, 2011), and MEC XXV - Coimbra, Portugal 2010 (April 15-17, 2010).

In celebration of the 30th anniversary, a festive ceremony was organized during the Conference Dinner at the Hotel Eurosol in Estarreja where Gerhard-Wilhelm Weber presented the history of IFORS, EURO, and EUROPT, complete with announcements of coming events. He further commended the warmth and friendship offered to the participants, citing MECXXX as an "unforgettable experience in science and friendship". The participants partook of the anniversary cake and a glass of champagne accompanied by songs performed by the Invited Speaker, Michael Greenacre.

The conference was concluded with an announcement of the next EURO mini conference *Improving Healthcare: New Challenges, New Approaches* to be held in Coimbra, Portugal on 30 March – 1 April 2015. (<http://www.minieuro2015.com/>) The organizers of XXX MEC passed the baton and best wishes to the organizers of the XXXI MEC.

GOR -Supported Event Attracts Interest in Analytics

Jochen Gönsch (University of Augsburg), Ralph Grothmann (Siemens, München), and Thomas Setzer (KIT und FZI, Karlsruhe)



Brita Rohrbeck <brita.rohrbeck@kit.edu>

GOR supported the conference on *Analytics* last April 11, 2014 in Munich. Stoking up great interest on the topic, the conference attracted some 75 participants, with two thirds coming from a wide range of industries and the remaining ones from leading universities and research institutes across Germany.



▲ Participants and speakers gather after the conference lunch.

Presentations from researchers and practitioners led to fruitful discussions and exchange. Hosted by Siemens, the conference started with a welcome reception at the Seehaus in the English Garden. This provided an opportunity to renew existing contacts and create new ones.

Thomas Setzer (FZI & KIT), greeting the participants on behalf of co-organizers Jochen Gönsch (Augsburg University) and Ralph Grothmann (Siemens), introduced the topic and declared the event open.

Gerhard Kress (Siemens) then spoke on *Analytics at Siemens – Science of Prediction* where he emphasized the integration of domain and device knowledge alongside data analysis in his talk on the overview of analytics activities at Siemens. Hans-Georg Zimmermann (Siemens) followed this up with *Modeling of Complex Systems with Neural Networks*, which explained the prediction of electricity prices as well as the relation to famous artists.

The presentation of Johann Prenninger (BMW) that followed was *Predictive Analytics with Field Data* where he described the technical entities and quantities, their connection with customer data and the current challenges in the interaction between development and service.



▲ Speakers hold Munich souvenirs presented by the appreciative organizers.

Ulrich Reincke (SAS) presented *Stochastic Energy Bid Price Optimization Using SAS Solutions*. Starting with the workings of the energy market in Germany, he

presented a solution to the optimization of the corresponding bids.

Wolfgang Faisst (SAP) then sketched the advantages of in-memory and parallel computing under the title *SAP HANA – Big Data*. He gave an insight into applications in different fields such as energy provision, predictive

maintenance, and football.

The morning presentations were concluded by Daniel Keim (University of Konstanz) who showed the possibilities of *Visual Analytics*. He demonstrated that many analytical tasks, such as network traffic analysis, require the integration of users' knowledge, while other problems lend themselves well to fully automatic analysis.

GOR is currently focusing on analytical processes, in particular on challenges at the interfaces between data science and mathematical optimization. In line with this, Business Analytics & Optimization will be the theme of this year's GOR annual meeting to be held in Aachen from September 2 to 5.

Lunch was followed by a talk of Oliver Seitz (1&1) on gaining *Customer Insight* in a telecommunications company, in particular, how the extensive automation of data-mining processes allows for quick and effective preparation and follow-up of marketing campaigns, even with limited manpower.

André Müller's (prudsys) talk *Real-Time Return Prediction in E-Commerce* addressed a pressing topic in mail-order business. In the clothing sector, return rates of over 50 percent are expected and generate high costs. The speaker explained the approach to predicting the likelihood of return in real-time.

Ralf Gitzel (ABB) illustrated the use of *Industrial Service Analytics* for providers of industrial products and services. He described the typical practical problems – such as the low numbers of cases – and their relevance for the reliability analysis.

The final presentation was on *Advanced Analytics for the Optimization of Catalog Pricing for Tour Operators* by Claudius Steinhardt (Universität der Bundeswehr München). Based on the data of a large European tour operator, he outlined a model-based approach for selecting hotels.

The event left all participants raring to attend future events on Analytics and appreciative of the organizers and presenters. All speakers were presented with a Munich souvenir. 🌐

Good. Better. Best. *An Analytics Maturity Model that Fits*

Aaron Burciaga <adburciaga@gmail.com>, CAP

The Sears, Roebuck and Co. catalog once offered customers products in three tiers of quality—"Good", "Better", and "Best". The price for each product corresponded to distinguishing features that made choices better, and others even best. It was an elegant solution for simpler times. These paper catalogs provided customers with an information model for prudent investments in products such as a pair of boots—fitting customers both literally and figuratively according their needs, resources, and even size.

The INFORMS Analytic Maturity Model (AMM) emulates these "Good", "Better", and "Best" principles in two ways.

First, the fervor of Big Data and Business Analytics has led to a bumper crop of competing analytics maturity models that can be characterized as "home-grown or proprietary" (good), "scholarly" (better), and "international standard" (best) solutions. As a nonprofit association of O.R. and analytics professionals with 11,000 members from across academia, business, and government, INFORMS is uniquely qualified and positioned to introduce the new standard. Use of the AMM is free. The AMM is not associated with any commercial software or service. INFORMS invites IFORS members to sample the new model and share the website with others.

The second way in which the AMM is reminiscent of Sears, Roebuck and Co. catalogs is that it efficiently organizes information to fit solutions to customer needs, resources and size. No one size fits all. Thus, AMM guides you toward developing an appropriately scaled analytics program with right-sized investment(s).

During your assessment, the AMM will guide you through a process to score analytic maturity in three crucial areas: Organization; Analytics Capability; and Data & Infrastructure. Each one of these three themes is

further defined by the four factors shown in Figure 1.

In the spirit of TurboTax, Web-MD, and other award-winning applications, the AMM will ask you to answer 12 fundamental questions about your use of analytics. Scores are entered on a 10-point scale that identifies beginning, developing, and advanced analytics maturity. You can then view your scorecard with customized recommendations, set goals and build a plan to incrementally develop the analytics maturity score, and track progress over time. Whereas you may find you are a 3/Beginning today, through the linked services, benchmarks, and best practices, you will be able to determine how and when you could arrive at a 7/

Advanced. This goal-setting feature identifies what specific actions, policies, or investments will be necessary to achieve that level of analytic maturity and assists you, clients, and executives to: (1) Develop and execute action plans; (2) Justify resource investments; and (3) Target key areas within the business.



Figure 1. AMM Themes and Factors

Context for each of the "as-is" and "to-be" scores is enriched by the benchmark information provided according to your industry—baselines by which you can compare your business' current state and goals against other 'like' businesses. This unique feature of the AMM helps create or maintain a competitive advantage and provides both the rationale and justification for investments.

Just as Sears, Roebuck and Co. catalogs once met customer needs with tiered products, the INFORMS AMM provides tailored assessments and solutions for right-sizing an analytics program. Complete your assessment today, fitting you and your business to good, better, or best options for analytics maturity at www.informs.org and share your reactions and ideas by contacting INFORMS communications director Barry List at barry.list@informs.org. 

OR for Development Section

Approaches for Successful OR/MS Application in Developing Countries*

Arabinda Tripathy <tripathy44@rediffmail.com>

Does OR for developing countries require a different approach? This article presents several aspects of this issue.

OR characteristics that have a great relevance to developing country problems are: its multi-disciplinary nature, and its major focus on problem solving, as opposed to the use of novel and sophisticated techniques that are worthy of scholarly publication.

A multi-disciplinary team that is focused on solving the problem at hand goes a long way towards a successful OR project in a developing country setting. A question then arises as to what constitutes a successful OR project. If the study has made an impact on the decision-maker in any way, maybe reinforcing his outlook or changing his action plan, then the OR study can be considered successful. Admittedly, environmental factors have a greater influence in a developing country than in a developed country context. The success of the study depends a lot on being able

to incorporate all the environmental factors.

Dimensions of an OR/MS study of relevance in this aspect are: the type of study, the type of involvement of the operational researchers/ management scientists, and the type of outcome. The **type of study** refers to the scope (analysis, recommendation, implementation). Some studies concentrate only on the analytical aspects. Others go beyond it to include specific recommendations, while still others go further to include implementation of the recommendations. The **type of involvement** of operational researchers is related to scope. Ideally, regardless of the sponsor's desired involvement, >>



>> the operational researchers should put themselves in the shoes of the decision maker and look at the implementation and its consequences even though the involvement may be limited to analysis. The **type of outcome** will depend on the scope, ranging from filing a report to bringing about a change in approaches to the problem.

The developing country context which impact OR/MS studies to a great extent are:

- Political/ Economic instability;
- Highly complex systems where the impact is not easy to identify;
- Decision maker is not clearly identifiable, political and other interferences are common;
- Lack of adequate information; and
- Low level of technology.

Factors given above make for very complex systems where the interdependence among various sub-systems is very high, necessitating complex and specific analytical approaches. Such a situation makes assessment of the problem intricacies difficult, leading to an inadequate problem assessment and resulting in an unfavourable outcome.

Suggested strategies, which consider the above factors and lessons learned from various OR/MS studies, follow:

- OR/MS analysts need to undertake the study with substantial amount of commitment and dedication. Efforts must be spent in doing preparatory mundane work, including collection of raw data.
- Operational researchers are encouraged to influence the sponsor of the study to include implementation in the scope if only an analysis has been specified. This will result in greater commitment and involvement of the sponsor and ensure greater success.
- A multidisciplinary team needs to be formed involving not only



If the study has made an impact on the decision-maker in any way, maybe reinforcing his outlook or changing his action plan, then the OR study can be considered successful.

operational researchers and persons from specific knowledge domains, but also persons from the sponsoring organisation.

- The team must be involved in all the stages of the study from data collection to implementation. The team has to identify and associate itself very closely with the sponsoring organisation and follow through till the benefits are derived.
- An OR study is a change process that requires the OR study team to handle the educating process of all the people involved in the study.
- Conflicts and pressure from various groups are normal parts of OR/MS studies. The study team must be prepared to handle this and work under adverse conditions.

Difficulties encountered in carrying out such studies include:

1. In most cases, project duration was more than twice compared to estimates;
2. Substantial effort was spent in educating the team members and the stake holders; and
3. The precise scope of the study had to be redefined after proper assessment of the environment.

Nonetheless, the approach resulted in success in many cases, as measured in how the study impacted planning of the decision-makers. Success rate was low in cases where there was substantial pressure on the study team from outside the system under study and in many cases, where hidden agenda came into play.

To sum up, success of operational research in a developing country context relies on taking a much wider view of the problem and a readiness to commit to a long-term involvement. 

*Adapted by the author from the paper with same title in *Operational Research for Development* edited by **Jonathan Rosenhead and Arabinda Tripathy**



ICORD 2014

International Conference on OR for Development

The Art of Modeling, the Challenges of Implementation

July 10-11, 2014 @ University of Lleida, Catalonia, Spain
(immediately preceding IFORS 2014 July 13-18)

Call for Participants

OR for Development enthusiasts are invited to attend the ICORD.

The Program

The program will include a Workshop on Facilitated Decision Analysis for Policy Making in Developing Countries by Gilberto Montibeller (Dept. of Management, London School of Economics)

Invited speaker is Panos M. Pardalos (www.ise.ufl.edu/pardalos) who will speak on Optimization and Economic Modeling of Energy Systems Centering CO2 Issues

Paper presentations on various topics relevant to OR in development have been arranged. Non-presenting participants will be invited to review one work which interests them and give comments on the presentation.

Important Information on Fees and Payment

Registration fee is inclusive of participation, materials, lunch and snacks for the 2-day conference: US\$300

Registration will remain open until June 15. Participants coming from developing countries may write to the organizer to apply for a fee waiver.

IORS Sees Increased Membership Amid Various Programs



Nezam Mahdavi-Amiri <nezamm@sharif.ir>



Membership in the Operations Research Society of Iran (IORS) increased from 600 in 2013 to 800 in 2014. This news comes after the successful conclusion of the Seventh International Conference of Iranian Operations Research Society held from May 14 to 15, 2014 at Semnan University, Semnan, Iran <http://or2014.semnan.ac.ir>. Papers submitted from Iran and other countries including Germany, Czech Republic, Italy, Denmark and Austria numbered 720, of which 227 were accepted for oral presentation and 358 as posters. Registered participants reached 920. The day before the conference on May 13, the Third Annual Operations Research Competitions were held for both the undergraduate and graduate levels with nine teams from various academic institutions in Iran participating. Meanwhile, the best Ph.D. dissertation award in Operations Research was given for the first time during the opening ceremonies.

Preceding the conference was a two-day international workshop on *Interval Programming* conducted in English by Milan Hladik of the Charles University, Prague, Czech Republic, and Michal Cerny of the University of Economics, Prague, Czech Republic. In addition, four other two-hour workshops were conducted in Persian on various topics.

The month of May also saw the publication of the Iranian Journal of Operations Research, <http://www.iors.ir/journalVolume> 4, Number 1, with 7 original articles.

The executive council of IORS continues to hold monthly meetings to discuss and coordinate pertinent issues relating the society and its international activities.

Pushing for Analytics Expertise Through Open Source



Cathal Brugha <cathal.brugha@ucd.ie> President, Analytics Society of Ireland

The December 2014 issue of the IFORS News featured the change in the name of the Irish OR Society to the *Analytics Society of Ireland* with its proposition that the future of OR lies in analytics.

Prof. S. P. Mukherjee, former President of the Operational Research Society of India, Vice-President of IFORS, and President of the Asian-Pacific Association of Operational Research Societies (APORS), has just completed a trip to the University College Dublin (UCD) Centre for Business Analytics in Ireland, and discussed the rapid and enormous growth in Analytics, and the demand for education and training in this area in Ireland and India. They agreed that a revolution has taken place, from the time when OR provided great training for graduates, but was not applied much in companies. Now senior managers in companies are writing software and coding algorithms, and want to learn even more at a higher level about how to use analytics in practice. Increasing numbers do MSc in Business Analytics in UCD on a part-time basis, and come to the course with a high level of understanding of the possibilities of analytics. In high-tech countries such as India the increase in demand for analytics training and development is similar, mainly amongst people in their forties who cannot take the time off to do even part-time masters

degrees. This large increase in demand is also more than can be handled by visiting lecturers from countries such as Ireland that moved early into Analytics. It could benefit from an initiative somewhat like the Monster Online Courses, but different, in that Online Courses or Distance Learning are resource heavy and focused on basic courses.

To develop Analytics in the way that fits what is needed would require that top experts in Analytics make lectures on their areas of expertise available through Open Source, preferably through a credible platform. To take this further it would help if the same platform were usable to facilitate exchanges of expertise, advice, review of documents, skype and conference calls. Could IFORS organize or sponsor the organisation of such an infrastructure, through which members could provide this for free? If this led to demand or interest in doing this for payment this could be organised separately, possibly through direct contacts.

Would there be an interest among IFORS members to provide such a platform, or to discuss how this might be done? Those who are interested may contact the author for a possible meeting in Barcelona.

ORSI Plans for 47th Annual Confab After A Successful 2013



Manjusri Basu <orsihq39@dataone.in>

The 47th Annual Convention of ORSI is scheduled from December 20 to 22 at Tirupati, Andhra Pradesh, India. An international conference on *OR at the Centre Stage of Big Data Analytics* will be held in conjunction with the convention. Convention organizer is the Tirupati Chapter of ORSI in association with Sri Venkateswara University of Tirupati, Peru University of South America and the Indian Statistical Institute (ISI).

This conference follows the successful 46th Convention held in Srinagar, Kashmir last year from October 21 to 23. It was hosted by the Dept. of Statistics, University of Kashmir. An International Conference on *Operations Research for Data Analytics & Decision Analysis* was organized in conjunction with the annual convention. A four-day international workshop on *Optimization Techniques & Software* preceded the convention.

This was followed by the December 5 to 7, 2013 *International Conference on Facets of Uncertainties and Applications* organized jointly by the Calcutta chapter and the Department of Applied Mathematics, Calcutta University.

Other activities for 2013 included:

- Examination on Graduate Diploma on Operational Research conducted in May 2013;
- Faculty development programme from July 1 to 5 on *Management Research: Methods and Statistics* sponsored by AICTE and organized by the Calcutta Business School in collaboration with the ORSI;
- National seminar on *Educational Reforms for Sustainable Development* jointly organized by the Ajmer Chapter of ORSI and Dayanand College - Ajmer on March 31, 2013; and
- National Workshop on *Optimization and Its Application* from 13 – 14 September organized by the Durgapur Chapter of ORSI in association with the Central Mechanical Engineering Research Institute (a constituent of CSIR).

ORSP Conducts Workshop on System Dynamics



Edwin Bunag <esbunag@dlsud.edu.ph>

The Operations Research Society of the Philippines (ORSP) organized a two-day hands-on workshop on *Systems Thinking and System Dynamics* on May 9 and 10, 2014. The technical workshop was facilitated by Dennis Beng Hui, Victor Paolo Reyes and Emil Fernandez from De La Salle University's Center for Operations Research / Management Science. The workshop introduced the concepts and tools in understanding complex systems using system dynamics. Venue was at the Technological Institute of the Philippines, the workshop sponsor.

Participants learned the basic principle of systems thinking and its role in policy making. They were taught how to illustrate and model the relationship within the system by creating causal loop diagrams using freeware VENSIM. The second day of the workshop involved extensive use of the software to solve the cases presented. The workshop concluded with a discussion on SD validation tools. Limited to 30, participants comprised of a good mix from the academic, private and public industry sectors. 



▲ Dennis Beng Hui explains causal loop

SOBRAPO Set to Replicate Highly Successful 2013 Symposium



 Annibal Parracho <annibal.parracho@gmail.com>

Operational Research for the Management of Public Security will be the theme of the 46th Annual Symposium of the Brazilian Society of Operational Research (SOBRAPO). The Symposium will be hosted by SENAI-CIMATEC - a university, technical school and technology centre geared to meet the demands of the industrial sector by training skilled workers, providing technological services and developing applied research in Salvador, the capital of the State of Bahia.

As in the past years, hundreds of papers are expected to be submitted to fill 70 technical sections on such topics as Multicriteria Decision Analysis, Graph Theory and Applications in Administration, Agriculture, Communications, Education, Energy, Environment, Finance, Management and Health.

If the 45th Symposium is to be gauge, participants in excess of 600 are expected. They can expect to again hear very interesting talks by

accomplished speakers who, last year, included: Paul Harper (Cardiff University) who talked on *On The Quest For Efficiency In Healthcare: OR Saving Lives*, Charles Harrell (Brigham Young University and ProModel Corporation) on *Ultra Innovation Using Simulation* and Carlos Henggeler Antunes, (University of Coimbra) on *Multicriteria Evolutionary Algorithms Applied to Design and Energetic Efficiency*.

In 2013, workshops were organized by Franklina Toledo (USP), Maurício Resende (AT&T), Roberto Iachan (Petrobras) and Thibaut Vidal (MIT). The Roberto Diegues Galvão Prize for the best paper was awarded to Leslie Foulds, Hugo Nascimento, Humberto Longo and Bryon Hall, of the Federal University of Goiás, for their work on *The Successive Linear Approximation Approach To The Design Of Congested Urban Traffic Networks*. This year, participants could again look forward to highly informative workshops and the awarding of the Galvao Prize. For more details, please visit www.sbpo2014.org. 

ALIO/EURO Gets Set for Applied Combinatorial Optimization Workshop



 Mari(t)a Urquhart <urquhart@fing.edu.uy>

The triennial ALIO/EURO Workshop on Applied Combinatorial Optimization is all set for the 2014 edition to be held from December 8 to 10 at Montevideo. Organizer Operations Research Department of the Computer Science Institute, Faculty of Engineering, Universidad de la República, Uruguay is calling attention to the deadline for paper submissions (<http://www.fing.edu.uy/en/alio-euro-2014>). Registration will be open until the conference date, allowing interested researchers and practitioners to attend the conference. Following tradition, oral presentations of accepted papers, as well as several talks of prestigious invited speakers have been lined



up for the academic program. The social program will include activities aimed at encouraging worldwide collaboration among researchers in combinatorial optimization. The relaxing environment of the conference venue combined with the pleasant beginning-of-summer weather promises a memorable experience for the participants.

This joint activity of the Association of Latin-Iberoamerican Operational Research Societies (ALIO) and the Association of European Operational Research Societies (EURO) seeks to bring together Latin American and European researchers and to stimulate activities and discussions about methods and applications in the field of combinatorial optimization. Researchers from other regions are most welcome. The previous workshop was held in 2011 in Porto, Portugal. 



ORSSA: Taking the Analytics Lead in Africa



Martin Kidd <martin.philip.kidd@gmail.com>

OR in South Africa

OR has been practised by various institutions in South Africa since the 1950s. Much of the initial research was performed within the context of the mining industry by the Council for Scientific and Industrial Research (CSIR), established in 1945, and the Operational Research Bureau, at the University of the Witwatersrand in 1952. OR techniques were eventually also used by the South African Defence Force for applications in the military; by Iscor for applications in the steel industry; and by the South African Railways for routing and planning problems in railways. The first international OR textbooks were published in the 1950s. In 1961, OR formed part of the Applied Mathematics course for third year students at Stellenbosch University. During this time, the National Research Institute for Mathematical Sciences (NRIMS) also established a Division for Operations Research and Statistics within the CSIR. From here, OR spread further into academia and industry, leading to the establishment of OR as a valuable academic discipline. By the early 1970s, postgraduate degree courses in OR were introduced at various universities, such as the University of South Africa, the University of Cape Town, the University of the Witwatersrand, and Stellenbosch University.

An important development by the late 1960s was the formation of various groups interested in OR, such as the Statistics and Operations Research Group at the University of Cape Town and the Johannesburg Operations Research Group.

The birth of ORSSA

In 1968, a multi-disciplinary OR meeting held in Johannesburg attracted more than 180 researchers and practitioners. A result of this meeting was the formation of a National Steering Committee, which was tasked with exploring the possibility of establishing an Operations Research Society in South Africa. The group eventually succeeded in organising ORSSA in Johannesburg on November 20, 1969. In this meeting attended by 150 individuals, ten high quality papers were presented.

The Johannesburg Chapter was the first regional chapter to be established in 1970, followed by the Pretoria Chapter and in 1972, by the Western Cape Chapter. Two other chapters were since formed, namely the Vaal Triangle and the Kwazulu-Natal Chapters. These five chapters cover the larger centres of the country and form the backbone of the society as they provide a platform for networking continuously throughout the year. Each regional chapter is governed by its own constitution and executive committee, organizing various chapter activities, such as colloquia, workshops, visits to where OR is applied in industry, student competitions and panel discussions throughout the year.

ORSSA houses two publications, namely a newsletter, which is published in March, June, September and December, and an open-source peer-reviewed journal, called ORiON, which is published in June and December. The newsletter not only acts as a window to the OR community at large by providing OR-related news, advertisements, and general activities around the globe, but also allows for notifying members of upcoming activities, calls for papers for the annual national conferences and CVs of graduating students looking for work. Regular items in the newsletter include a personal profile on a member of the society, a feature article on the application of OR techniques, and an OR-related book review.

The society's flagship publication is ORiON, the official scholarly journal of the society published biannually since 1985. Papers published in this journal typically fall under

the general categories of: development of new theory, OR success stories, OR case studies and OR methodological reviews. The content is often focused on work done in an African context and the developing world, generally showing an interesting mixture of theory and practice.

ORiON enjoys accreditation from the National Department of Education in South Africa, i.e., authors employed at academic institutions in South Africa are supported by government subsidies when publishing in ORiON. Hard copies of both ORiON and the newsletter received via post are among the membership benefits.

The prime event of the year is the national conference organised annually in September at different venues across the country. The conference is an opportunity for the OR community to come together and share ideas and experiences, to present OR-related work in progress and receive feedback, to pay tribute to exceptional achievements by members of the society, and to enjoy the various social components of the event which never cease to strengthen the bonds between old friends and new colleagues. Highlights of the event include opening and closing plenaries by a keynote speaker (usually an international expert in OR), and the presentation of the premier scholarly award of the society, the Tom Rozwadowski medal. Named after one of the driving forces behind the establishment of ORSSA, the medal is given to the best paper published in a national or international peer-reviewed, OR-related journal by one or more members of the society. A significant number of presentations by students have become a feature of the conference each year, ranging from honours (4th year) level to masters and PhD levels. Annual student competitions are also arranged in order to encourage participation by students.

Since ORSSA hosted the International Conference on OR for Development (ICORD) in 2001, there has been a conscious effort to try and reach out to our fellow African countries in order to promote and spread OR. A great stride in this direction was made in 2011 when the 40th ORSSA annual conference was held at the majestic Victoria Falls in Zimbabwe. With the first one held in Swaziland in 1996, this was only the second time that the conference was held outside South Africa. The conference was organised jointly with the National University of Science and Technology (NUST) in Zimbabwe, which has been active in teaching and promoting OR for many years in the country. Many delegates from all parts of both South Africa and Zimbabwe attended, including a small number of delegates from other African countries, such as Botswana and Nigeria.

ORSSA at a glance

The Operations Research Society of South Africa (ORSSA) is a non-profit scholarly society and South Africa's national body for Operations Research (OR). Aiming to accommodate and further the interests and activities of those engaged and/or interested in OR in South Africa, ORSSA provides a platform for researchers and practitioners to connect and share ideas across multiple disciplines with a strong emphasis on development and sustainability within the context of Southern Africa. This is largely achieved through regional chapter activities, an annual conference, a quarterly newsletter and a biannual journal. The society has roughly 320 members and five regional chapters, and, in addition to being a member of IFORS, has been an associate member of EURO since 1993. For more information, please visit www.orssa.org.za.

Challenges Ahead

Looking forward, the society's goals are to maintain the quality of service it is providing to its members in terms of networking and to promote OR. Important issues that are continuously under the microscope are: marketing of OR to industries and schools; strengthening the bonds between academia and industry and between theory and practice; and reaching out to other African countries.

In the developing world, there is much that can be done with the tools and techniques that OR provides. There is much use for the OR experience and ability that many South African researchers and practitioners possess. ORSSA champions the cause of binding these resources together towards a better future for OR and the developing world.



Optimising the Retail Network for New Zealand Post

Simon Mardle, Louise Fildes, and Tony Lewins* <tlewins@uk.ey.com>

As in many equivalent post office organisations around the world, the retail operation of New Zealand Post (NZP) is in major transition. The decline of its traditional business of providing postal products and servicing bill payments, prompted NZP to offer new services and products. In addition to offering new general retail products, it has created KiwiBank, a retail banking operation offering home loans, current accounts and other banking services. The KiwiBank services are offered in a proportion of existing post office outlets and are capturing an increasing market share.

However, trends have resulted in challenges for the retail network. The demography of the country is evolving, with a trend away from rural to urban areas. Customers increasingly abandon the High Street in favour of out-of-town malls and Internet shopping. NZP's retail network is becoming highly sub-optimal, both in terms of serving the existing business and particularly for the future of the operation. New Zealand Post therefore needed to identify alternative profitable networks in terms of the number, type and location of outlets across the country, whilst continuing to meet universal service access obligations.

Dimensions of the operation include: 1600 current outlets, 2 modes of ownership (owned or franchised), and 5 current outlet types. Outlet types range from a full independent post office providing a full range of services to a convenience store offering limited services and several other new outlet types possible in the future. There is also the potential to open new outlets anywhere in the country. In order to compare the vast number of combinations of outlet options, a model was needed which could automatically identify the optimal network by identifying closures, new openings and changes in type and/or ownership of outlets. This is clearly a complex optimisation problem, with a very large search space and solution space. Figure 1 shows examples of the different current outlet types.



▲ Figure 1: Current examples of post shops

A particularly complex challenge is modelling the prediction of business flow around the network as it changes. For example, an outlet closing may result in some business being lost (varying by type of product) and the remainder being recaptured by other outlets in relation to their relative location. Further, it is not sufficient to take a simple 'proximity' view since if an outlet closes for example in a city, some of the business may transfer to the suburbs where people live, rather than the next nearest outlet to where they work. In addition, the flow of business is dependent on a range of other factors, including the nature of the area and its demographics.

The flow of business on network change means that it is not possible to take a simplistic 'outlet by outlet' hill-climbing approach and the



▲ Simon, Louise and Tony receiving the OR Society's President's Medal for this work

network needs to be considered as a whole. For example, a currently unprofitable branch may become profitable if it attracts business from a closing outlet, and the optimal n-outlet network in an area may have a completely different composition from the optimal m-outlet network.

NZP Requirements

New Zealand Post needed a multi-user PC-server model that could optimise the network under any specified set of conditions. The model should allow NZP to investigate many scenarios in relation to the future of the business, including the introduction of new types of outlet, new products and different assumptions about future business volumes. The model needed the flexibility to fully accommodate all operational, financial and social constraints. Given the requirement to embed the model in the business to aid future decision-making, it was important that the model: be easy to use by non-modellers; could be integrated with operational systems for easy refresh of data; and produce results that are easy to understand and interpret, providing support for any detailed business case, especially in terms of 'helping to explain why'.

Solution approach

The following stages were involved:

- Problem formulation and detailed specification.
- Design and development in close collaboration with NZP analysts and regional managers. This meant that the team split their time between working in the UK and in New Zealand.
- Development of the optimisation algorithm. While simulated annealing is an appropriate technique for solving this type of problem, the team needed to develop a 'hot-start' optimising algorithm to provide significant speed improvements.
- Model testing and calibration with NZP analysts and regional managers. This involved using the model to look at historic closures where business was known to have moved and comparing the model outputs with what actually happened. It also involved looking at forecast closures where work had already been done within the business to mock up where business would move and comparing this with outputs from the model.
- Scenario testing and exploration as part of a user training phase.
- Implementation of the model within an end-to-end process to enable the best network footprint to be determined on an ongoing basis in terms of the right type of distribution points in the right locations across New Zealand.

The Model

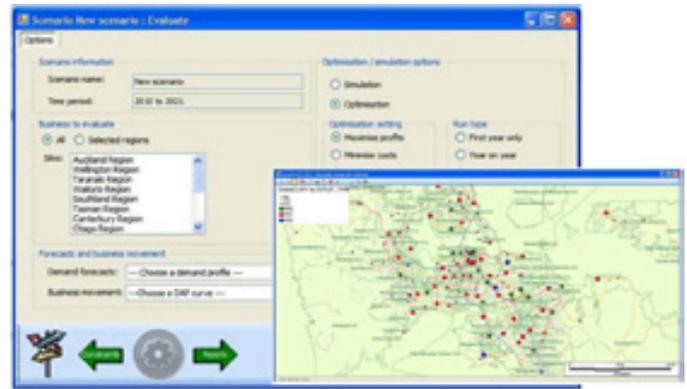
The main components of the model are:

- An optimisation engine based on an adapted simulating annealing algorithm to automatically identify the profit-optimal network for any scenario. The optimisation incorporates all financial, practical and operational constraints

- An embedded Geographic Information System to assist visualisation of the network
- A flexible, easy to use interface to allow users to run and compare many scenarios
- A database incorporating volume and financial business data, geographic data providing point to point distances between existing outlets and 2000 population regions, together with 15 demographic characteristics of each of these regions

In calibrating the parameters of the model, particular effort went into those governing business movement on network change. Existing data from changes that had recently happened were combined with the team's prior experience and knowledge of local experts from the business.

The model was built in Visual Basic .net with an underlying SQLServer database and embedding the GIS display tool MapXtreme. An illustration of its 'look and feel' is displayed in Figure 2.



▲ Figure 2: Illustration of the look and feel of the model

as suggested by this quote from NZP, "We've have had some good positive feedback thus far, and some potential solutions which hadn't been considered until NOP {the name they gave the model} was used."

It is also being used to allow NZP to establish how best to conduct the complete redesign of the network in the Christchurch area from the enforced store closures and impact on the city brought about by the 2011 earthquake.

A major benefit is that the model has proven to be an accurate predictor of how business will flow when the network does change. According to NZP, "One highlight so far has been verification of the actual impact of store closures against the model predictions. The model has proved over 90% accurate in predicting business flow."

The way results are presented and particularly the embedded mapping functionality is especially useful for Regional Managers to 'explain why', given the politically sensitive evolution of the business. Being easy to use and update data, the model gives NZP the ability to regularly investigate future scenarios as the operation evolves. 🌐

*Executive Director, Business Modelling, EY (formerly Ernst & Young)

Use of the model has identified how best to evolve the business into a radically new operation and improve annual performance by tens of millions of NZ dollars.

It has allowed completely new outlet types and product mixes to be investigated, which would not have been possible without the model...

Implementation and benefits

The model has been fully implemented and used by NZP since February 2011. Use of the model has identified how best to evolve the business into a radically new operation and improve annual performance by tens of millions of NZ dollars.

It has allowed completely new outlet types and product mixes to be investigated, which would not have been possible without the

TUTORIAL

A Beginner's Guide to OR Consulting

Elise del Rosario <elise@jgdelrosario.com>; Sue Merchant <suemerchant@hotmail.com>; John Ranyard <jranyard@cix.co.uk>

You are meeting a client about a possible OR project for the first time. Where do you start? Read on.

THE FIRST CLIENT MEETING. Your first encounter with a client is usually at the investigation stage. You are there because the client heard about you or your firm and thinks you or the firm might be able to tackle his job; or you're an internal consultant, part of an OR, Business Analytics, or Management Services group in the company, and another department needs your help; or you are a student meeting the client about your first practice project. Whatever the situation, the client isn't obliged to take you. She can do the project herself or find someone else. This first client meeting might be your last too. How do you tip the odds in your favour? *(NB these notes don't cover the more formal procedures for making a bid for work when often the analyst doesn't get an opportunity to meet the client before bidding. Also for project teams, experienced members lead all phases of the work described here.)*

Clients instinctively trust people who look and sound professional to do professional work. Looking and sounding professional involves:

- *Doing your homework.* If the client sent you a packet of readings, make sure you've gone through them, internalized the information, and prepared follow-on questions for clarification. Find out more



about the client organization – what it does, for whom and where, how big it is, where the client fits into it. You can quickly do the literature search – on the company, on the industry, on the problem area, etc, using, for one, on-line resources available.

- *Showing up on time.* The client can keep you waiting, but you never keep client people waiting. If there is a secretary or assistant there, try to chat to them about the organisation – it's amazing what you can pick up in the way of useful background info!
- *Dressing appropriately.* The days of suits with white or blue shirts and red or yellow ties plus wingtips worn by McKinseyites or IBMers of old may be gone, but you still need to look presentable, preferably over-dressed than under-dressed relative to the client. It goes without saying - the professional look goes as well for hair, beards, and fingernails, unless you're in the advertising or private investigation business where you could probably ignore this.
- *Bringing your business cards and exchanging them early.* If your client is Asian or has travelled the world extensively, be aware that the protocol requires you give your name card with two hands accompanied by a very subtle bow.

- *Taking the cue from the client on the tone of the meeting.* If the client indulges in light talk or banter before getting down to business, then engage him appropriately. This is where being well read and up to date, be it politics, sports, business or macro economics, comes in handy. Keep the tone light and appropriately funny – you do want to give the impression that you’re easy and fun to talk to.
- *Selling yourself,* subtly and discreetly. Casually interject previous work and experience into the conversation. Learn how to explain Operations Research in four to five sentences.
- *Talking well.* Mentally organize what you want to say, articulate well, pronounce correctly and try not to slur, fall into grammatical lapses, and depend on verbal crutches. Importantly, unless your client is similarly inclined, avoid using ‘techspeak’, industry jargon, and buzzwords that just confuse the client, or worse, paint you as an insecure show-off. Use layman language in your proposal and formal presentations.
- *Taking notes,* for you might forget key items. Avoid calling attention on your note taking, as you click away on your laptop. Use a pen and a notebook or pad instead.



Your primary objective is to thoroughly understand the problem and confirm that the potential solution is within your/your firm’s area of expertise. Some tips:

- Don’t be embarrassed to ask the client to explain something she said that wasn’t clear. Don’t pretend to understand when you actually didn’t.
- Make sure you understand the full quantitative as well qualitative impact of the problem or the current situation. Why is it significant to the company? This will be important when you try to justify to the client the cost of engaging your services.
- Understand what has been tried before. If these have failed, ask why. If you can, formulate alternative solutions aside from what the client had in mind and bounce these off him.
- Come to the discussion with an open mind, without a preconceived solution. Remember what Maslow said, “If you only have a hammer, you tend to see every problem as a nail.” In other words, never bend the problem to fit your favourite technique!
- Always ask for specifics – specific dates, specific costs, specific individuals, specific locations. If the client is too high in the organization to give details, ask who lower down could provide such details.
- Attempt to get a full understanding of all the players and groups involved - the ‘stakeholders’ – those who: are impacted by the problem; understand the problem; have to buy in to the solution proposed; can influence the decision; has to vet and approve the proposal; have to listen to your final report. Get a clear idea of the organizational chart.
- If time allotted for the meeting is too short, or you simply didn’t get through all your questions by the end of the appointment period, do not hesitate to arrange for a second meeting.

PRELIMINARY ANALYSIS BEFORE AGREEING A PROPOSAL FOR THE PROJECT. Assuming you’ve made a positive impression, do you say “OK, I’ll do the project”? Of course not, since you’ll need to confirm your hypotheses, think through the scope of work, and verify your client contact’s perceptions and grasp of the facts. Your objective is to get the client’s green light to study the issue further, gather some data, and interview some key personnel before you make a formal proposal. Here are things to watch out for during the survey or research, or corroboration phase:

- If you have the opportunity, interview everyone you think might have some insight into the problem or opportunity at hand. This could include your contact’s bosses, peers, and subordinates. For

each one, make sure you mention whom you’ve talked to previously, especially people above her pay grade. But make sure you have permission to talk to them since there may be sensitivities, e.g., the boss may not want you to talk to the people affected by a downsizing project; or the client does not want you to talk to a rival peer.

- Prepare your specific interview questions for each specific individual ahead of time.
- Don’t lead or guide the interviewees to the answers to your questions. You need their perspective and you want to understand their biases.
- Data gathering, even for preliminary high-level data for the survey stage, can be extremely painful. You’ll find that, more often than you can imagine, the data doesn’t exist, isn’t regularly recorded, lost, taken away by the recently-terminated clerk, inaccurate, or just plain made up. Among other things, the current state of the data determines how much time to allow for data collection, verification and ‘cleaning’ during the actual project, and how crude or sophisticated the model might look like.
- Recognize that you will always need to get back to the client, especially if you’ve uncovered things that he wasn’t aware of or which he failed to mention, or if the facts and sentiments on the ground don’t match his own perception and thinking.
- This is the time to do a more extensive literature search – have a look to see who else has done work on this in the past and pick up any good ideas you can. IAOR abstracts are good, or use GoogleScholar or Zotero to search (and the IFORS resources site, maybe). Look up the topic area as well as the technique. Document your web searches and references carefully and keep in a file. Do a search on press reports too – they sometimes have useful information on the topic.
- Think carefully about the project and how you are going to tackle it, especially if you’re thinking of building a model of any sort. Exercise care and choose sensible boundaries, e.g., if it’s simulation, don’t model the country’s health system – just the clinic you are interested in! It can often be useful to:
 - ◊ Bounce ideas off colleagues and mentors you trust; see if the approach you’re thinking of makes sense to them.
 - ◊ Maybe use soft OR techniques, e.g., drawing a ‘rich picture’ (from Soft Systems Methodology) to get your head around the problem. If it will help, also draw a stakeholder diagram.
 - ◊ Seek a contact person in the organisation who might have more time to help you than the client who may be very busy.
 - ◊ If your client is OR literate, consider asking them too.
 - ◊ Get a feel for the culture of the organisation – how are decisions made and discussed? Are they made by groups, individuals, after consultation?

PREPARING THE PROPOSAL. If you think you can help solve the problem or complete the project successfully, then you need to prepare the formal proposal or Terms of Reference. The written proposal will usually need to be backed up by a formal presentation. What things do you need to keep in mind for proposal preparation and presentation?

- The proposal should include: description of client problem area; the project objectives; proposed methodology; information required and who will provide them; hardware and software needed; outputs or deliverables; potential risks to completion; how results will be communicated at the end of the study; confidentiality requirements.
- The most important part of the proposal is the ‘methodology’, the project ‘work plan’, or ‘scope of work’. Clients will call it by different labels but what it should do is give the client a good idea of what you propose to do to achieve the desired outcome. But that’s a secondary benefit – the real benefit is that it forces you to think through the project, and visualize how you will execute the work.

- Having identified all the project steps and sub-steps and who's responsible, you're now in a position to estimate how much time you need to complete each sub-step and each step. Veteran consultants always err on the side of conservatism. Sure, the inventory data should be available and fully cleaned within a week, but what if the data quality is poor? What if the inventory supervisor can only afford after office hours to help you on this project? Pay careful attention to tasks that need to be done by others, especially client personnel, since they almost always never give the time promised at the front end.
- Now it's time to put this into a timeline, or GANTT chart, or work program and propose a realistic end date. Make sure you know your own bandwidth limitations. Don't assume you can do 10-12 hour days six days a week for ten to twelve months. Build in a buffer, in anticipation of potential rework or tasks not included in the terms of reference.
- Writing down what you plan to do and what you want to achieve is good. It will also be better to write down what you are not going to do – 'out of scope', or 'limitations of the study' – and what could get in the way of success which are out of your control.
- Proposals always include a restatement of the problem or opportunity, as stated by the client and as verified, refined, and put into a slightly different perspective by you. It not only demonstrates your understanding of the situation, but your additional insight gives the client confidence that you've internalized the problem. It also gives the management team one last chance to disagree with the whole project premise.
- The proposal must include the project cost. You have the option to give a fixed price or a 'best estimate' although there is usually a caveat that the actual charge will not exceed a certain percentage above the estimate. In reality, very few clients willingly accept estimates and most will insist on a fixed fee arrangement. How much do you charge? The answer depends on such considerations as – what is the prevailing rate, how much you value your expertise, how much the competition charges, will you give a 'friends and family discount', and how much you expect to work during the year.
- Written proposals almost always need to be followed up by formal presentations, usually in front of a management committee. This is where Microsoft's PowerPoint or the Mac's Keynote come into play. Although effective use of PPT slides is the subject of a whole different tutorial, some basic tips are in order:
 - ◊ Never too much graphics or too many fonts or too many highlights and colors that distract.
 - ◊ Never too much text – don't put the entire presentation into the slide.
 - ◊ Resist the temptation to add in fades, dissolves, sounds, and other animation effects.
- Since you will have real out-of-pocket costs, it should be clear that these are to be charged as they are incurred. However, it's reasonable to prepare a detailed estimate of these costs for client review – for example, you can't expect the client to approve business class travel every weekend when the client imposes economy class travel on their own staff.
- Occasionally, you'll get other people or teams of subcontractors involved in a project – for example, a team of programmers, or an SAP specialist, or an Android-to-corporate-network expert. To the same degree of detail that you iron out the project arrangements with the client, you should be as exacting and tight with your subcontractor contracts.
- Data is at the heart of any OR-related project. You need complete, current and accurate data to run your model against. Data collection should therefore be a primary concern:
 - ◊ Check how data is generated. Speak to the people involved if you can to check how accurate data is likely to be.
 - ◊ If you can and have time, document the system for collecting the data at source – even a sketch may help you understand the system better.
 - ◊ Document any assumptions you make about the data – e.g., what type of arrival distribution it may follow – and be prepared to discuss in your report how this assumption may affect your results if it is untrue.
 - ◊ Even the best data will need 'cleaning': i.e. filling in missing data or deciding to eliminate outliers.
 - ◊ Collect the data and label it carefully in a spreadsheet – what is obvious to you when you enter the data may not be as clear several months later. More importantly, no one else will understand it if you have to hand it over!
 - ◊ If you need to use questionnaires to gather data, do test them out first on colleagues and friends, or run a small sample using 'friendlies'.
- Run your model as early as possible and do a reality check of the results. Do the results make sense? Validate the model as best as you can. If the preliminary results seem to make sense, close to what you expected, run these by the client to check what they think.
 - If you had a long list of interim and final deliverables, it's only prudent to keep checking that you are giving your client what you promised in your proposal document.
 - It's always a good idea to regularly submit written project updates, usually monthly, and to see the client more often to give short verbal updates, especially on problems encountered and how she might help. Most of the issues will centre on client staff cooperation and availability of data.
 - Get to know as many of the client's company executives and middle managers as you can. You will use this 'circle of influence' as you continue to sell other projects for the client's company.



WORKING THE PROJECT. Maybe you got lucky. Or you're simply extremely competent and it couldn't be hidden. Whatever the reason, the client signed on the dotted line. Now what? Well, you have to execute. But execution is not merely doing the right things and doing things right – though those are difficult enough to do in the best of circumstances. You also have to make it worth your or your company's while. Even if it's just your time you are putting into the project –there's still the opportunity cost since your time could have been spent on some other project. But what if you incur real out of pocket costs that you can't recover, such as subcontractor, equipment, software or rental costs. What do you look out for?

- Ask for a down payment. This represents 'skin in the game'. By cutting this check, the client acknowledges that there's no backing out. If you're billing the client monthly – and this should be clear in the terms of reference, then it's understandable to bill the equivalent of the first month's expenses.

- Be aware of a common pitfall. The client wants an extra feature and asks you to include it in the project. Or, he found out that what he had asked for won't work and asks you to redo a portion of the project. Or a new corporate directive comes down, requiring a major workaround in the procedures manual that you've written up. Resist the initial reaction to immediately say yes. Whatever the new issue is, it will require additional time, and therefore, cost. Should you absorb the additional charge? You may need to formalize a change order and get the client to sign off on the additional charges, as well as an official extension of project timeline. You may also decide to grant the request after careful thought that it is small enough, or that this enhances your chances of landing other projects from this client.
- For long projects, there's always the possibility that your client could be reassigned, promoted or terminated, and someone takes over the project. This is always fraught with danger and should be treated seriously. You will need to re-sell the project and bring the new client on board very speedily.

- As with the proposal, the client will expect a final report as well as a formal presentation to conclude the project. If you've given the client a system, application, or model, he will also expect a user's guide or a manual of some sort. Ask the client what he would like to see in the final report as well as the oral presentation.
- The final report will usually include:
 - ◊ A one-page Executive Summary of what you did and why and what you found out. Think of it as an 'at a glance' description for very senior people who have only seconds to read things.
 - ◊ Background – what the client organisation does, how is it structured
 - ◊ Reasons for the study request
 - ◊ Reasons for approach adopted compared with other possible ones
 - ◊ Description of work done
 - ◊ Description (including formulations, diagrams, screen shots etc) of any model or programme built or written
 - ◊ Details of data collected and analysed (put actual data and detailed results in an appendix or CD)
 - ◊ Results
 - ◊ Conclusions/Recommendations/Suggestions for further work of value to the organisation



or refuse to pay the balance. What other things shouldn't you forget, assuming you want to continue to do similar work in the future? Here are some reminders:

- Don't forget to bill the balance of the project fee. Make sure all out of pocket costs are accounted for.
- Try to get written feedback from the client – what you did extremely well, what you could have done better, how useful the project was, if it was worth the corporate spend. Get a reference if possible and keep this in a file for future use. Prepare different versions of the project write-up, from the 2-3 sentence ad copy to the full page project insert in your consulting PR kit. Get the client to sign off that it's OK to publish the write-up. Clarify if you have to hide the client name or not.
- Prepare the 'lessons learned', even if it's only for you. This should include the original work plan vs. the actual – which tasks did you under-estimate/ over-estimate? What steps did you miss out on? Which out of pocket charge did you forecast incorrectly? In other words, how would you do this same project better next time? 🌐

Readers are encouraged to share their consulting experience to enrich this piece by emailing any of the authors. Please indicate if you allow IFORS News to print your letter.

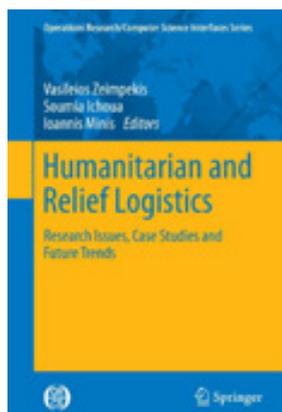
Well, you completed the work – and you managed to keep the shirt on your back. The client seems to be happy, or at least didn't complain

BOOK REVIEW

OR for Minimising Disastrous Consequences

Hans W Ittmann <hittmann01@gmail.com >

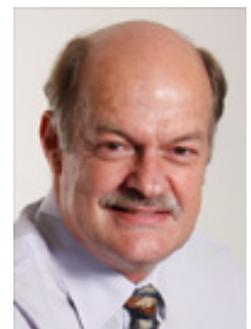
The past decade alone has witnessed numerous large and devastating disasters across the world causing the tragic loss of lives and property. Reminding the world of the destructive forces of nature were the most recent terrible flooding in Serbia and Bosnia and Herzegovina (May 2014), the super typhoon Yolanda (or Haiyan) that struck the Philippines (November 2013) causing death and destruction, the Great Tohoku Disaster off the Pacific coast of Japan and the subsequent tsunami (March 2011) making this earthquake the largest in modern history in that country, the 2010 earthquake in Haiti, the Katrina hurricane (2005) that hit the south eastern part of the USA and the Indian Ocean tsunami (on 26 December 2004). These, and many other disasters left entire populations in need of urgent assistance and relief. Owing to the inherent uncertainty of post-disaster environments and the coordination required to manage the efforts of numerous parties offering assistance, providing such relief is highly complicated.



Humanitarian and Relief Logistics by Vasileios Zimpekis, Soumia Ichoua and Ioannis Minis, Editors, 2013. Springer Science + Business Media, New York, USA. pp 220, ISBN 978-1-4614-7006-9 (Hardcopy), 99.99 EURO.

Humanitarian logistics is a relatively new field which endeavours to deliver timely relief to those affected by providing appropriate emergency supplies in sufficient quantities where and when required. The typical stages

of disaster relief operations are mitigation, preparedness, response and recovery. Over the last decade, researchers have built on the foundations of business logistics and developed this new field to deliver effective, appropriate and timely disaster response. Van Wassenhove (2006) stressed this aspect by stating that logistics operations account for 80% of what is required during humanitarian relief operations.



Humanitarian and Relief Logistics is a collection of chapters outlining a diverse range of research work and advances focusing on the development of effective modeling and solutions in the field. Included are two case studies which use and build on what happened in separate disaster occurrences. In addition, there is an effort to highlight future research trends.

The book has three main sections, two of which are devoted to the preparedness and mitigation stages of disaster relief operations. The first section on **preparedness** emphasizes that being well prepared for any eventuality ensures fast, appropriate and proper response. The Network Design and Humanitarian Aid Distribution Problem (NDHADP) is introduced initially in Chapter 1. It seeks to determine a distribution network to deliver various supplies via depots to demand points. Chapter 2 focuses on the layout of relief centres, including temporary ones, and how these impact waiting times. Modeling the layout of these centres and developing queuing models allow evaluation of alternative layouts and estimating average waiting time of those served. Experimental analysis show that choosing appropriate relief centre layout will result in significant reduction in queuing delays.

The aim of Chapter 3 is to model the last mile distribution fleet management problem at a regional level. A stochastic model is developed to locate vehicle hubs, allocate demand areas, as well as to route and schedule vehicles. In the latter case, resource sharing is allowed with the objective of travel time minimization given a range of constraints. The next chapter introduces the concept of quantitative preparedness measures and a methodology to construct such measures. The challenge here stems from the complex relationships among the event, the response, the vulnerability and the consequences. This approach allows for the measurement of emergency and relief responses.

The second section covering **mitigation operations planning and execution** focuses on systems, models and algorithmic approaches for the coordination, planning and execution of disaster and relief operations. Chapter 5 deals with emerging problems faced by the military, which typically plays an important role in Humanitarian and Relief Operations (HROs). Here, solutions through the use of logistics optimization models for planning the HROs are proposed. Chapter 6 outlines and proposes a procurement method for humanitarian logistics based on auctions. It aims to address and promote coordination amongst humanitarian organisations and suppliers after the onset of the disaster. This is achieved by using a single round sealed-bid auction to handle the unique characteristics within this environment.

In Chapter 7, a fuzzy multi-criteria methodology to manage priorities and resource assignment in critical situations is developed and described. The model allows for the dynamic management of priorities based on parameters obtained from the specific situation and for the selection of the most appropriate resources. Chapter 8 deals with the complex problem of gate assignments to trucks in a transshipment facility. A heuristic approach is proposed which, based on performance indicators such as total distance travelled, total discharge end, total waiting time of tours and average discharge duration, behaves and performs very well. Uncertainty regarding demand for supplies is usually a huge problem. This necessitates quick response even in situations where there is lack of data to ensure fast and efficient methods to coordinate relief delivery operations as data becomes available. A multi-agent based framework for solving the dynamic vehicle routing problem required in such situations with uncertain demand and travel times is described in Chapter 9.

Finally, two interesting case studies show examples of post disaster research to develop rigorous approaches to design, operate and improve disaster relief systems. A disaster prone country because of its location, Indonesia is the focus of the first case study where the relief networks established by a variety of organisations are reviewed and analysed. The research established that coordination among different players is problematic and suggested two models to design networks given the existing facilities. The proposed approach was tested successfully. In the second case study, the researchers used what actually happened during the Tohoku earthquake in Japan to develop a multi-objective optimization model. They included different objectives such as the total shortage of supplies and fuel consumption. The model was tested against what was done during the disasters. The exercise provided fruitful insight into how the tool could help in the future.

In conclusion, **Humanitarian and Relief Logistics** is a useful addition to the growing literature on humanitarian logistics. By touching on a range of interesting topics, it shows that the field is a fertile area of research in its pursuit of solutions to help a world that lurches from one disaster to another. 

Van Wassenhove, LN, 2006. Blackett Memorial Lecture - Humanitarian aid logistics: supply chain management in high gear. J Oper Res Soc, 57(5), p 475-89.

Regional Correspondents

ALIO	Latin American Ibero Association on Operations Research	Annibal Parracho
APORS	Association of Asia Pacific Operations Research Societies	Degang Liu
EURO	Association of European Operational Research Societies	Gerhard Wilhelm Weber
NORAM	North American Operations Research Societies	Grace Lin

Section Editors

OR Impact	Sue Merchant/John Ranyard
OR for Development	Arabinda Tripathy
Book Review	Hans Iltmann

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	Austrian Society of Operations Research (OGOR)	Raimund Kovacevic
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	The French Operations Research and Decision-Aid Society /ROADEF (Société Française de Recherche Opérationnelle et d'Aide à la Décision)	Luce Brotcorne
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	Operational Research Society of Nepal (ORSN)	Sunity Shrestha Hada
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