



Newsletter

Operations Research Society of South Africa
Operasionele Navorsingsvereniging van Suid-Afrika



December 2004

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FROM THE PRESIDENT'S DESK

By Wim Gevers (wg@sun.ac.za)
ORSSA President



Wim Gevers

By the time that you read this newsletter some of you will be looking forward to an imminent well deserved year-end rest period after a hectic year. In this final message for 2004 I want to reflect briefly on the activities of ORSSA this year.

We started off the year with a strategic work session for the executive. The value of meeting face to face and to have time available to talk about issues affecting the Society proved to be invaluable. Whereas this was a positive experience, there was also a realisation that as long as we operate the executive on a voluntary basis, there is limitation to what we can achieve. This remains a challenge for the future.

During the course of the year most chapters had some form of activity. ORSSA members participated in international activities: the EURO conference, the IFORS developing countries teacher's forum, as well as the Africa OR activities. To all members who participated in these international forums, a heartfelt thank you. Often participation in these forums is due to personal interest, but in the end it is a reflection of what we can and have achieved in South Africa and ORSSA. I am convinced that this ambassadorship has paid off in South Africa being awarded the IFORS 2008 conference.

September also saw our annual conference in Bellville and seemed to have been enjoyed by all. I reflected on the conference in our last newsletter, but at this conference we also changed the ORSSA constitution so that a more effective hand-over in the executive could occur. The "old" executive's term of office had been extended until the end of the year with the new executive taking office from the beginning of the new year, allowing for a transfer of duties between in-coming and out-going office bearers during the last few months of the year.

Through this column I wish to extend a hearty word of thanks to those who have served the executive over an extended period of time and those who have taken on the responsibility to serve the society in the following year. Firstly to Hans Ittmann who has completed the presidential cycle for a second time – you stepped in as president on short notice when the then vice-president emigrated and have been doing and are still doing a sterling job for OR in South Africa. Thank you! Hans' services are, however, not lost to the executive, since he has accepted the position as IFORS 2008 Conference Chair on behalf of ORSSA. We wish you well in this endeavour and undertake to support you! Theo Stylianides has retired as treasurer after a number of years of meticulous work in ensuring that the financial administration and membership information of the society are in an excellent condition. Thank you for your dedicated work. Also a word of good luck to Dave Evans who is taking over this position from Theo. Leo Tomé has done excellent work over the past number of years in editing the newsletter. Under his editorship the newsletter has undergone a significant change for the better and he leaves the editor position with the newsletter as a quality

glossy quarterly. Thank you for all the effort that you have put in to make the newsletter what it is today. Leo will not be lost, however, since he has taken on the newly created role of business manager for the newsletter. Our best wishes also go to Cobus Potgieter who is taking over as editor of the newsletter. Stephen Beneke has also done a sterling job in maintaining the ORSSA website over the past year and now leaves this position to Petrus Potgieter. Thank you, Stephen, and we look forward to your contribution, Petrus. As additional member on the committee Trinette Evert has administered the annual student competition even though being incapacitated for a considerable time – thank you for your efforts on behalf of the student members of the society.

Last year already Paul Fatti stood down as editor of ORiON, and Jan van Vuuren took his place as editor. The transfer arrangement between the editors was that Paul would handle both Volumes 18 and 19 and Jan would be responsible for Volume 20 onwards. This implied that Paul still did a considerable amount of work this year in getting these two volumes out. Thank you, Paul, for dedicated work over numerous years.

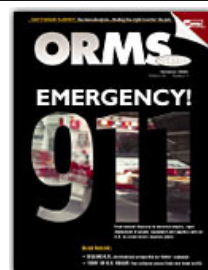
Also joining the executive committee is Marthi Harmse who has assumed the duties of Vice president of the society. Thank you for committing four years of your time to the society. A new additional member on the committee is Ozias Ncube – we are also looking forward to your contribution.

At this point it is appropriate to say thank you to my committee for your support this year. Thanks also to our sponsors – advertisers in the newsletter, exhibitors at the conference, as well as SAS for sponsoring the annual student competition – for your loyal support of the ORSSA activities.

Now all that remains is to wish you all prosperous festive season. For those who are fortunate enough to take a break from work during the year end – I hope that you will have a peaceful rest period and be invigorated for the challenges of 2005! ♦

DISCLAIMER

The views expressed in this newsletter are those of the contributors, and not necessarily those of the Operations Research Society of South Africa. The Society is not responsible for the accuracy of details concerning conferences, advertisements, etc., appearing in this newsletter. Members should verify those aspects themselves if they intend to respond to them.



ORMS Today's

ORMS Today is the official magazine of INFORMS. Visit the ORMS site at <http://ormstoday.pubs.informs.org> or go to <http://www.informs.org/> for more information on INFORMS.

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FROM THE EDITOR



Cobus Potgieter

I am honoured to be the new editor of the ORSSA newsletter. It is my privilege to introduce to you the first ever December issue of the newsletter.

This issue is full of new information and contains articles that will keep you on the edge of your seat, so hold on!

The main article describes the necessity of OR in Logistics Management. It also discusses the way Logistics Management is presented at the Department of Logistics at Stellenbosch University.

Jan van Vuuren and Stephan Visagie discuss the new appearance of ORiON that we will see from Volume 20 onwards. Their article also explains new procedures on how and when to submit papers and why.

Open source software is improving each day and is becoming more and more accessible. Even Mark Shuttleworth released his own South African version of UNIX this year. Neil Manson explains the meaning of 'free' software and answers some questions arising around it.

ORSSA has been a member of IFORS and has contributed to it for many years. Theo Stewart explains where ORSSA fits into IFORS and EURO and how ORSSA members can benefit from this.

At the end of the year we look back and notice everything that changed. As OR practitioners we have to keep up with these changes. The articles in this issue are examples of how OR practitioners adapt to changes and can benefit from them.

I want to thank every one who contributed to this issue and especially Leo for his willingness to help and share his knowledge. I want to challenge every one of our readers to take a break this festive season, enjoy the holidays to the maximum and spend some time with loved ones. May this be a blessed time for each and every one.

Until next time,
Cobus

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Contributions and other forms of communication with the editor can also be conducted from the website at:
www.orssa.org.za

MEMBER PROFILE: DAVE MASTERSON

By Cobus Potgieter (*pottie@dip.sun.ac.za*)



Dave Masterson

Dave was born on 21 July 1939 in Durban. He matriculated and finished his BSc degree in Durban and went the University of Birmingham to start his MSc degree. He concluded this and returned to South Africa in 1965.

Dave was a senior manager with a major commercial bank in South Africa for over 27 years and has now set up a consultancy which is currently providing an OR, statistical and system service to all banks.

Prior to joining Standard Bank in 1974 he was a senior manager responsible for Accounting, Scrip Management, Internal Audit, IT and O&M for a leading merchant bank. He has also been a management consultant and had extensive industrial experience in IT, Operations Research and computer operations, systems and programming before his involvement in the financial fields.

He served in various capacities in Standard Bank, having originally been recruited to set up an Operations Research department. He was at various times, General Manager Assistant, IT consultant, Decision Support Manager and was responsible for Pricing (non-interest bearing products), Retail Credit and Corporate Credit Risk Management and also had other roles internally and externally.

Dave was responsible for introducing retail credit scoring systems and corporate risk management systems. He was largely responsible for reforming the retail bank charges system in the SA market in the 80's (leading the Interbank Technical Committee for SA Banks) and, in a similar role, the establishment of the Bond Market Association in the 90's.

He led a consortium of four banks and building societies that set up the first ATM sharing network in SA at the end of the 80's, both as leader and technical leader, which was a forerunner to the current ATM sharing network operating in the country.

Apart from his activities in financial fields, Dave is a founding member of the ORSSA having twice served as President and was previously a member of the Computer Society and Statistical Society.

Amongst his achievements outside the banking and financial fields, he assisted in the design of the first GPC machine for plastics research in SA, a least mileage model for SA Railways, a pilgrim-mill mathematical model for Tube Investments, inventory models for S&L and Iscor and many other OR models for industrial application.

When did you first become involved in OR and ORSSA?

I was working for a computer company and did some moonlight work for Prof Herbert Sichel of the Operational Research Bureau and Chamber of Mines.

He is undoubtedly father of Operations Research in SA and was highly regarded in international statistical and mining circles. He inspired a lot of young students to adopt OR and his concepts of applying mathematical techniques to business problems really excited me.

Why did you first become involved in OR and ORSSA?

Prof Sichel arranged for me to join his OR team on the copper belt, but other events in Zambia at the time kyboshed this idea, so I enrolled for an MSc course in Operational Research at Birmingham University in the UK.

When I returned to SA in 1965 I set up a small consulting company, OR and System Advisory Services (ORSAS) and was involved in a number of linear program, inventory and critical path projects. In 1967, ORSAS was absorbed into an Accounting consultancy headed by Len Fine. We worked closely with National Productivity Institute (NPI) at the time.

Interest in OR techniques was growing and the SA Statistical Society was keen to start on OR interest group but we all realized that OR had far wider application and deserved to be recognized as a separate profession.

NPI offered to sponsor a number of OR workshops around SA and I put forward Prof Pat Rivett's name to conduct these talks. I'd met Pat at National Coal Board in UK a number of years earlier and was impressed by his somewhat cavalier and practical approach to OR. He struck me as an ideal candidate to launch OR in this country and this certainly proved to be true.

We arranged for Pat to address a gathering of interested enthusiasts at the Sunnyside Hotel and a wide range of about 130 people turned up. Prof Nabarro of Blackett's circus fame was also there. A steering committee was set up with Prof Sichel as chairman to establish the OR Society of South Africa and I was selected to arrange our first conference at Wits the following year. The society was launched at that conference.

Who will you describe as your mentors?

I had the good fortune to work with Profs Venter and Hattingh from Potch CHO at Sasol which first kindled my interest in industrial and business mathematical applications but I guess it was Herbert Sichel as well as Profs Haley and Vajda at Birmingham who laid the foundations for my later involvement in OR.

Steven Vajda and Maurice Sasieni certainly stimulated an interest in mathematical programming.

You have been a member of ORSSA for 36 years and have twice been elected President. What do you regard as the most significant changes in:

- **OR in South Africa over the last 30 years?**
- **the society over the last 30 years?**

The quality of entrants into OR and the breadth of the courses being offered has impressed me and this augurs well for the future. I believe OR has a lot to offer in helping to resolve many of the social issues facing the country and would like to see many of our young practitioners enter this area of operation.

You are currently involved with the company ORSAS/Creative Solutions.

- What does your involvement entail?
- In what way is Operations Research applied at Creative Solutions?

ORSAS/Creative Solutions provides a consultancy focusing on the simplest and most practicable way of resolving business issues. If an OR solution happens to fit into this framework this gives us great satisfaction but it is really the adoption of the OR approach and methodology in problem-solving that is the hallmark of our success.

What will you describe as the highlights of your career in Operations Research?

There have been many significant stepping stones en route but possibly a key point was reached when I was asked to set up an OR department at Standard Bank and I saw the potential for OR in the financial industry. I've seen OR penetrate all avenues of banking and in particular its application in financial engineering.

What do you regard as the greatest challenges for OR in the future?

The diversity of OR applications is both its strength and its weakness. It is not unusual for a young OR professional in the business environment to become a specialist in a particular area of operation, e.g. in the bank treasury or bank credit. This normally results in their being lost to OR as they develop skills in a differently oriented field.

The challenge is to retain such individuals as members of the OR fraternity, yet allow them to continue to blossom in their chosen speciality.

What is your message for young aspiring OR practitioners?

Seek every opportunity and start early in gaining exposure to different types of industry and business, but maintain focus on the skills you can offer an organization. ♦



Operations Research 2005 (OR 2005)

International Conference on Operations Research

September 7 - 9, 2005

University of Bremen, Bremen, Germany

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CHAPTER NEWS

Johannesburg Chapter's Annual General Meeting

By Dave Evans (davee@dbsa.org)

The Johannesburg chapter's annual general meeting was held at Wits Club on the evening of Wednesday 10th November. It was preceded by a talk by Elton Bondi, CEO of Cyst Corporation. He outlined the way in which his company uses what he calls "naïve" models of a business to allow executives to understand the dynamics of interactions amongst the many variables influencing the way the business is run. In the case studies he used, from the mining industry, these were typically factors such as ore grade cut offs, mining rates, areas of the ore body to be mined, and in what sequence, etc. The "objective function" was normally the NPV of the future cash flows modelled, although he emphasised that the "optimisation" was an iterative process evaluation with mine management – not an algorithm which exhaustively explored the possibilities in isolation from the decision makers. The software his company has developed makes this process very visible, so that there is a substantial degree of buy in from management to the final decision.

The Chapter has had a year with a similar level of activity to the recent years. Financially, the Chapter's bank balance has dropped slightly, partly because no charges were levied for functions, and partly because the chapter's share of subscriptions was left with the "national" account. Dave Evans, the outgoing chairman, is standing down, as he has become the National Treasurer, and his position has been taken by Neil Manson. The Chapter looks forward to another successful year in 2005. ♦

PRESIDENTIAL ADDRESS

By Wim Gevers (wg@sun.ac.za)

Every year the president addresses the delegates before opening the Annual ORSSA Conference. This year was no different as Wim Gevers enthusiastically communicated his message to members of ORSSA attending the conference in Bellville. His address is reproduced here verbatim.

Good morning Ladies and Gentlemen. It is a great privilege for me to stand before you today as your president. When I look at the hall of fame of those who have had the honour of serving ORSSA before me, I feel small, realising the contribution that I can make is insignificant in comparison to some of the great names of OR that have come before me. In addition my background is dissimilar to most of those that have come before me: I may well be the first president of ORSSA that has come from a business school and, not from the practice of OR or from a school of mathematical, statistical or modelling sciences. That will flavour the nature of this address.

In the realm of decision support a fair amount of work is being done in commerce and industry, yet many of those who are involved in decision support are not members of ORSSA, and probably do not even know of the discipline of Operations Research. If, from a business perspective, one was to reflect on where models could support and improve decision making, there are ample opportunities for OR to grow and make a huge impact. In the realm of business it was Peter Drucker, one of the great management gurus, now in his nineties and still worth listening to, who once said: "Business is about making things and selling things." The making part of "things" is usually addressed in business education by courses in operations management, supply chain management and logistics. This is the area where OR has in the past made considerable contributions, and is continuing to do so. Merely reflecting on the programmes of conferences, even our own annual conference, clearly shows that this is an area where OR is flourishing. Standard application of OR should become run of the mill to ensure efficiencies in businesses, and where challenging problems wait to be solved for added competitiveness. Yet OR cannot claim sole rights to this domain. Parallel to the contributions of OR specialists to the debate, one sees contributions to the solution of problems from business specialists and alternative societies. While our conference is running, there is a conference on supply chain management running under the auspices of the Barlow group in Johannesburg.

Of course, the other side of Drucker's definition of business, namely the selling of "things" also allows for contributions by OR. Not only is the consumer the end of the supply chain, and hence supply chain analysis also touches on the consumer side of selling, but marketing and sales management are also disciplines that allow considerable scope for modelling and decision support. In the past we have seen the application of analytical methods in marketing, and these have only become more sophisticated (I can recall a paper that was written by one

of the past presidents of ORSSA, Hendrik du Plessis, modelling the effectiveness of advertising). Today, as an example, we see that businesses are collecting data about who buys what when, and then using analytical methods, such as data mining, to support customer relationship management. Few OR specialists in South Africa seem to be focussing on marketing applications of OR.

If the making and selling of "things" are the pillars of business, then the most critical facet of making businesses work, and probably assumed to be in place when Drucker coined this phrase, are the people in a business. In the past and even still today, the management of people in businesses is left to the HR department (HR, as we know, standing for Human Resources). People are often still seen merely as a resource – if it has lost its value, it can be disposed of – and the reward for taking risk goes to the suppliers of financial capital. We no longer live in a world where lifetime employment is guaranteed – in fact often human capital is more at risk than financial capital, and this should be taken into account in risk-reward strategies. Progressive people management practices as well as triple bottom line reporting are placing more focus on this critical aspect of business. Often the issues involved are complex and multi-faceted and can probably benefit from the inputs of OR. I think that there is still a vast opportunity for OR to become involved in the softer side of business.

If the management of people is the one king-pin in business to support the making and selling of "things," another must certainly be finance. Finance is the most quantitative of the traditional business sciences. It is a discipline that has developed on its own and has come up with major contributions to knowledge and understanding supported by the use of models. One could argue whether a pricing model for an exotic option is OR or Finance, I would like to see it as the application of OR in Finance. Personally I feel that there are great opportunities for closer collaboration between the financial modellers and OR specialist for the advancement of the science of both Finance and OR. I am pleased to see that some papers presented at this year's conference have a financial bias and I hope that this will be a growing tendency.

In the 21st century one can no longer leave out information systems management as a critical dimension of doing business. Here too there are ample opportunities for OR to make a contribution – some of which we have already seen – in the form of network optimisation, security, encryption, to the mining of data from networks to roll out more efficient services. Apart from the technical side of information systems, there are also opportunities begging to be addressed via the implementation of ERP-systems. Often the ERP systems come with embedded production scheduling options – often a canned approach of using OR-methods, but nobody in the business really understand how to use these solution methods, or do so erroneously to the detriment of business (and possibly the perceived value of OR!).

The various functional disciplines of business all form part of an organisation's overall business strategy. Strategic Management has itself developed into a definitive subject area of scholarly research. Although many of the models developed

in strategic management are of a more descriptive nature, (for example Porter's Five Forces model), some also contain a measuring aspect. Probably the most popular model of the last decade in Strategic Management has been Kaplan and Norton's Balanced Scorecard. I have heard that there are critics of their work, but it has created an opportunity for improvement. William Hewlett of Hewlett Packard fame once said: "You cannot manage what you cannot measure." In that respect the Balanced Scorecard has created a method of measurement for improved strategic performance. If that is not practical OR, what is? From a strategic perspective, although it often involves the softer sciences, there are certainly contributions that OR can make towards the more efficient running of businesses.

Maybe a last comment as to the importance of OR for business. In the early 1990's the AACSB, the accreditation body for business schools in the USA, removed Operations Research as one of the core subjects that had to be included in the curricula of business schools. Although this could have been a death knell to OR as far as business education was concerned, OR has flourished, and with the advancement of superior software solutions OR has become much more friendly to the average business user who may not be a mathematical wizard. This has brought about a change in the AACSB's requirements, and from 2003 onwards Operations Research is again a requirement as part of the curricula of accredited business schools.

Just as businesses have to revisit their strategy on a continuous basis to ensure that they remain profitable by rendering a quality product or service needed by their greater constituency, so do learned societies. In this regard a society, like ORSSA, is no different – it needs to render a service that is perceived to be value for money by its members. A learned society as a voluntary association has in this regard probably more challenges than a professional institution where membership is almost a statutory requirement in order to practice one's profession.

The executive of ORSSA met at the beginning of the year for a strategy session, and although it did not bring us to clear-cut answers on various issues, the mere fact that we had time to deliberate on these matters was important, and a number of issues surfaced that needed attention. Reflecting back on the issues raised 7 months after the strategy session, one realises that steady incremental progress is being made, but that much still has to be done.

One of the issues raised was the investigation into organisations/societies that share common ground with ORSSA. It is quite clear from what I have said earlier, that

there are ample opportunities in this regard, the question is more of an identification of the most beneficial collaboration opportunities that will add value to members of both parties. The first success in this regard is the planned combined annual conference with the Institute of Industrial Engineering in 2005. I am, however, convinced that we need to search for a higher level of cooperation in more fields to make the collaborations a useful endeavour particularly for our members. How can this be accomplished?

In the first instance I am convinced that OR should be marketed (also one of the issues raised at the strategy meeting) so that all possible interested parties can take note of what has been achieved in the past, and could also be achieved for them. What is particularly pleasing is that this is an endeavour for which we do not have to re-invent the wheel. Due to the distribution of the special international issue of ORMS Today to ORSSA members, most of you are probably aware of the activities of INFORMS in trying to brand OR as "The Science of Better." If you have not done so as yet, I strongly recommend an extended visit to the websites that INFORMS has created to market OR, namely www.orchampions.org and www.scienceofbetter.org. Here we find some good ideas of how we could promote OR in South Africa, and Africa as well, and under the same "brand."

But merely being aware of what is possible is unlikely to make a large impact. We need to leverage knowledge by collaboration. I foresee a kind of collaboration between members of other societies, but with similarities to OR, where discussion forums could lead to the eventual establishment of special interest groups. INFORMS has a large number of special interest groups (SIGs), creating the opportunity for those working in similar areas of OR to collaborate effectively. Under the auspices of EURO there are also a large number of working groups focussing on specific areas of OR. The ORSSA membership currently seems to be too small to be able to add a SIG dimension, but that is a goal towards which we can work, especially if it could be done in collaboration with other societies.

The practice of OR is also attracting more and more emphasis – not to the detriment of the development of theory, but complementary to the development of theory. In fact, INFORMS president Rothkopf promotes the integration of theory and practice. Here too we have ample opportunities for the promotion of OR in South Africa. I estimate that about a third of our full members are employed by tertiary educational institutions, while the rest are in business or industry. We need to hear more about South African success stories. These successes need not necessarily be documented as scientific papers for ORiON – although that would also be most



welcome – but an easy to read article for the Newsletter would do wonders to spread the story of success. This can be promoted further by the publication of these success stories on our web-site, similar to the success stories on the OR Champions website. That is a challenge that I leave to all practitioners – share with the OR community your stories – success or failure – we can all learn from some else's failure!

For those that are in academia, continue the good work in developing and applying theory and publish it – ORiON may not be your prime vehicle, but by year-end the backlog will be eradicated, making it more attractive to publish in than in the past. But you can do even more: the Newsletter is also an ideal vehicle for a summary of a practical paper. In addition, set topics for Honours and Masters projects for your students that address some of the burning issues in the country, where the holistic, rational approach of OR can contribute significantly to improved decision making. In this way OR can contribute to develop our society.

These are examples of how individuals can assist in building OR and ORSSA – an almost natural consequence of one's daily work. But it does ask some added effort – as does any volunteer work for a society. And it seems as if this is where societies are starting to feel the changing patterns and demands of work over the last decade: individuals seem to have less and less time available to devote to volunteer work. This probably affects everyone, but in particular the committee members who have agreed to volunteer some of their time for the good of the society. It is pleasing to see that the membership numbers of ORSSA have increased over the past year – indicating that members still perceive that they are getting value from the society. That speaks volumes for the dedication of all who have contributed voluntarily.

ORSSA was established in 1969 – which makes the Society 35 years old this year. We can celebrate this and look back at the achievements of prior years: Volume 20 of ORiON should be published this year in a new format, the newsletter that started as a small photocopied information leaflet today has a professional appearance; the ORSSA website has been revamped and looks professional; member numbers are again growing as seems to be the attendance at the conferences. Lots to be proud about! At the same time we celebrate 10 years of democracy in South Africa. While 10 years of freedom for all our peoples is indeed something to celebrate, there is nothing to be complacent about: crime is still at far too high levels, amongst other due to far too high unemployment rates; economic growth is positive, but at rates that are too low to affect unemployment; the inflation rate seems to be under control, but IT connectivity rates are of the highest in the world; well-educated young people are leaving the country because they cannot find employment due to affirmative action; BEE is creating an number of super-affluent individuals (hardly disadvantaged any longer), yet the majority of people are living in poverty; education policies are changed after each election with a third minister of education after as many elections, and seemingly to the detriment of a solid mathematics education. This list is much longer – and that indicates the challenges that society has. Let us prove that the "Science of Better" can make it better! Thank you. ♦



37TH ANNUAL CONVENTION OF OPERATIONAL RESEARCH SOCIETY OF INDIA

In order to accomodate several requests from prospective authors, the last date for submission of Full Papers to be included in the conference proceedings is extended to 15th December, 2004.

Theme: Vision 2020: The Strategic Role of Operational Research

Venue: Indian Institute of Management, Ahmedabad Campus

Date: January 8-11, 2005.

ORSI Ahmedabad chapter is pleased to announce that the 37th Annual Convention of the Operational Research Society of India would be held during January 2005 at the Indian Institute of Management, Ahmedabad campus, Ahmedabad.

Visit: www.orsi2005.org

CHAPTER CALENDAR

Western Cape Chapter

By Margarete Louw (mjlow@msn.com)

Colloquium on Wednesday February 2nd, 2005 at 16:00

Speaker: Nicky Pantland

Topic: 3D Numerical techniques for determining the foot of a continental slope

Venue: Department of Applied Mathematics, Stellenbosch University

ORiON: A NEW LOOK

By Jan van Vuuren (vuuren@sun.ac.za) and
Stephan Visagie (svisagie@sun.ac.za)



At the ORSSA 2003 conference in Pretoria Jan van Vuuren (Dept of Applied Mathematics at Stellenbosch University) was elected editor of ORiON in the place of Paul Fatti, who stepped down after many years of excellent service to ORSSA as ORiON editor. In September 2004, Stephan Visagie (Dept of Logistics at Stellenbosch University) was elected business manager of ORiON in the place of Wim Gevers, who is now president of ORSSA and who has done a sterling job as business manager of ORiON over the years. Our thanks go to Paul and Wim for the significant time and effort that they have poured into ORiON over many years. However, they will not be leaving the management team of ORiON; both have accepted an invitation to remain on in the capacity of associate editors, and they are also willing to advise us on management issues surrounding ORiON, based on their many years of experience.

Paul and Wim have agreed to oversee the publication of ORiON up to volume 19, which appeared in September this year. Publication of ORiON from volume 20 (the current volume accompanying this newsletter) onwards is the responsibility of the new management team, and we have set ourselves a number of aims and objectives.

ORiON remains an accredited journal on the new government list of subsidised journals, in accordance with the guidelines contained in Act no 101 of the 1997 Higher Education Act. One of the conditions of this listing is that the refereeing process should be blind; i.e. referees should not be aware of the identities of the authors of papers that they review (in addition to the usual practice that authors should not be aware of the identities of referees who reviewed their submissions). In order to facilitate the blind refereeing process, the new instructions to authors (inside the journal covers and on the society webpage) request that papers be sent in without listing the names and affiliations of authors on the title page, instead only listing this information in a cover letter to the editor or associate editor to whom the manuscript is submitted. The new LaTeX style sheets that are available to prospective authors from the ORSSA webpage will also not allow for the inclusion of author details. In order to streamline and standardise the refereeing process a new standard refereeing report form has been designed and will be made available to the authors to help them improve their manuscripts, as well as for reasons of transparency, when refereeing decisions are communicated to authors. Each paper will be reviewed by a minimum of two referees before a decision is made whether to accept or reject a submission.

We envisage eventual electronic publication of ORiON on the ORSSA webpage. This will be a password protected

publication process, so that only members of ORSSA and paying subscribers to ORiON will have electronic access to the latest volume of the journal, as with most other journals currently published electronically. The creation of the necessary infrastructure to facilitate such electronic publication will be one of the tasks of the new webmaster.

We were tasked by the national executive in September 2003 to design a new and more modern look for ORiON, which is in line with the upgrade in the ORSSA newsletter's new look, introduced two years ago. The following decisions have been taken with regards to a new look for ORiON, and will take effect from volume 20 onwards. All papers are to be typeset in LaTeX. However, authors will still be able to submit manuscripts in either MS Word or in LaTeX. The final versions of accepted papers will be typeset in LaTeX (by the business manager in cases where original submissions were in MS Word and authors are not familiar with LaTeX) in order to create a standardised look for all papers and also because typesetting via LaTeX seems to be gaining ground as an international standard. Authors will nevertheless be encouraged to submit their contributions in LaTeX at the start, or to convert their manuscripts to LaTeX once accepted, if they are familiar with the package. The business manager has written a LaTeX style sheet especially for ORiON, and this is available via the ORSSA website (<http://www.orssa.org.za>), or via email, upon request to authors who wish / are able to make submissions in LaTeX. Authors will receive a final draft of their paper in pdf format (typeset in LaTeX) shortly before publication, so that they can proofread it and inform the business manager of any errors. A new, glossy front cover has been designed for ORiON, incorporating colour, so as to bring ORiON in line (in appearance) with other, international journals. These covers will be printed in bulk for many volumes of ORiON at a time, in an effort to save on costs, and the date and volume number of each issue will then be printed on this front cover in black, by means of an overlay each time. A new page size, namely the 190 × 260 mm currently used by many journals, which is considerably larger than the previous A5 size has been adopted as well as a thinner and finer paper quality (90gvm matt paper).

As part of a cost-saving initiative, preprints will no longer be sent out to authors in hard copy form as standard practice, when their papers appear in ORiON. Instead, authors will be provided with a high quality, photo-finish electronic copy of their paper (the same file that will go to the printers to publish paper copies of ORiON) in pdf format. Authors will then be able to run off as many copies of this file as they require, at no cost to ORSSA.

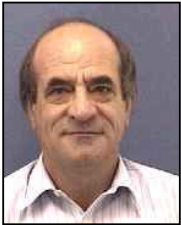
(Continued on page 7)

OPERATIONS RESEARCH: THE SCIENCE OF BETTER

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Operations Research: The Toolkit of the Logistician



By

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Introduction

Economic life in South Africa during the 1980s and 1990s was marked by rapid change. First, the economic deregulation of freight transport and the marketing of agricultural produce, the globalisation of business activities and liberalisation of international trade, and the lifting of trade sanctions against the country made transport decision-making more market-driven. Second, the development of effective information technology, easy electronic communication, the ability to perform comprehensive and complicated numeric analyses through the use of computer technology, and new holistic management approaches have made it possible to manage logistics channels and other complicated processes in a coordinated fashion, almost in real time. These trends convinced the University of Stellenbosch in 1991 to introduce Logistics Management as a field of study.

Successful business logistics practice requires that decisions reached must be founded quantitatively, mainly because of the various cost trade-offs involved in the logistics decision-making process. To support and enrich the offering of Logistics Management courses, the Department of Logistics of the University of Stellenbosch also makes extensive use of Operations Research in its teaching and research programmes. Operations Research can indeed be regarded as an indispensable analytical toolkit of the logistician. The principles of Operations Research are logically consistent. Therefore, an integrated logistics process with cross-functional coordination achieved through the application of Operations Research methodology should lead to better results than one lacking coordinated performance.



The Council of Logistics Management was founded in 1963 to make high-level executives aware of the critical role that physical distribution could and should play in improving marketing efficiency and profits.

The concept of Business Logistics Management

In 1998 the Council of Logistics Management (CLM) defined Logistics Management as “that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers’ requirements.” The CLM’s definition of logistics is the generally accepted description of the concept in contemporary business logistics management literature in the world. Some comments on this definition are in order:

First, as the definition indicates, business logistics management includes the actions required to (a) prepare (plan), (b) organise (implement) and (c) execute (control) the activities of a firm when moving materials or finished products to customers. Preparation and planning activities include the selection of (i) facility sites (including type, number, location, and size and capacity), (ii) durable equipment necessary for the flow of products through the logistics network, (iii) distribution parties (including wholesalers, retailers and third party service providers) and (iv) carriers (including choice of transport mode) necessary to offer service at the level demanded by customers to achieve the goals of the firm. The organisational and implementation aspects of logistics include (i) the allocation and positioning of resources and (ii) the fixing of production and distribution activities to respond to customer needs in an efficient manner in order to accomplish the firm’s goals. Execution includes operational aspects (such as routing of trips and scheduling of vehicles and crews) and control include monitoring and reviewing performance (such as quality of service, expenditures, productivity and asset utilisation) so as to ensure that (i) the logistics process satisfies customers effectively, (ii) the firm’s resources are deployed efficiently and (iii) corrective action is taken when performance is not in line with goals.

Second, because logistics management revolves around planning, organising, and controlling the logistics process, it encompasses many of the firm’s activities, from the strategic level through the tactical to the operational level. Logistical decisions are typically classified in the following way:

- The strategic level (i.e. preparation and planning) deals with decisions that have a long-lasting effect on the firm. Because data are often incomplete and imprecise, strategic decisions are generally based on aggregated data (obtained, for example, by grouping individual products into product families and aggregating individual customers into customer zones).
- The tactical level (i.e. organisation and implementation) includes decisions that are updated any time between once every month and once a year. Tactical decisions are often based on disaggregated data.

- The operational level (i.e. execution and control) refers to day to day decisions. Operational decisions are customarily based on very detailed data.

Third, the objective in logistics management is to be efficient and effective across the entire system. The objective is to minimize system-wide costs, from transportation and distribution to inventory of raw material, semi-finished goods and finished products. Thus, the emphasis is not on simply the cheapest or the fastest transport or reducing inventories, but rather on an integrated and coordinated systems approach to the logistics process. The acceptance of the total-cost logistics concept has changed the relative importance of the different logistics activities and has led to cost trade-offs between transport/materials handling services provided and the operation of warehouse and production facilities assuming greater importance. For example, traditional wisdom is that

materials can be handled most efficiently by using maximum size mechanical means to reduce the number of moves needed for a given amount of material. While reducing the number of trips required is a good objective, the drawback of this approach is that it tends to encourage the acceptance of large production lots, large material handling equipment, and large space requirements. Small unit loads allow for more responsive and less expensive material handling systems. Furthermore, continuous manufacturing flow processes necessitate the use of smaller unit loads.

Cost minimisation ought to be confined only to eliminating waste and not pruning costs at the expense of greater revenue. Reducing logistics costs makes sense only if the foregone profits are smaller than the cost reduction. Similarly, the acceptance of additional logistics costs – for example, an airfreight delivery instead of delivery with a cheaper, slower

Competencies	OR techniques
Make rational decisions	Utility theory Feasibility analysis Decision trees Multi-criterion decision analysis (AHP)
Schedule machines, projects, vehicles and crews	Machines: Algorithms (Lawler's and Johnson's) Projects: CPM and PERT Vehicles: Heuristics, integer programming Crew: Heuristics, integer programming
Determine routes for vehicles	Heuristic models (Clarke-Wright, Travelling salesperson, Chinese post-person) Transportations Assignment Transshipment Integer programming
Control inventory levels	Deterministic models (EOQ) Probabilistic models Linear programming Integer programming Dynamic programming Nonlinear programming
Location of facilities	Network models (centre, median, requirement problems, covering problems) Location in perpendicular coordinates Linear programming
Forecasting	Exponential smoothing Linear regression Markov analysis
Applying queuing theory	Birth-death processes Poisson arrivals Exponential and Erlang service times Queue networks Chi-square test
Analysis with simulation	Discrete-event simulation Random numbers and Monte Carlo simulation Simulations with continuous random variables

Table 1: Operations Research techniques in Logistics

mode of transport, but which is not offset by lower inventory carrying cost or other logistics cost savings – is justified only if net revenue increases as a result. The optimal level of logistics expenditure occurs where marginal expenditure (i.e. the expenditure attributed to the last unit of output) equals marginal revenue (i.e. the revenue attributable to the last unit of output).

Operations Research competencies required in logistics practice

To become a graduate logistician at Stellenbosch University requires that both Logistics Management and Operations Research be taken as major subjects. Apart from the utilisation of financial, mathematical and statistical analysis techniques included in the subject of Logistics Management, the Department of Logistics requires its logisticians-in-training to become competent in at least eight of the areas of Operations Research taught by the Department. These compulsory competencies are: (i) decision-making, (ii) scheduling, (iii) route planning, (iv) inventory control, (v) facility location, (vi) forecasting, (vii) application of queuing theory and (viii) analysis with simulation.

Table 1, on page 6, lists the specific Operations Research techniques that are taught at undergraduate level in order to achieve each logistics competency. (Operations Research as offered in the Department of Logistics of course entails more techniques and competencies, because the subject is not taught exclusively to educate logisticians.)

Conclusions

The ability to apply Operations Research methodology effectively is an imperative for successful logistics practice. Operations Research can indeed be regarded as an indispensable toolkit of the logistician. The following eight tools are probably the most important instruments in this kit: (i) decision-making, (ii) scheduling, (iii) route planning, (iv) inventory control, (v) facility location, (vi) forecasting, (vii) application of queuing theory and (viii) analysis with simulation. ♦

(ORiON: A New Look – Continued from page 4)

In today's publish-or-perish environment a long turn-around time may affect a journal adversely, in the sense that contributors may prefer to send papers to journals with fast turn-around times, at the cost of journals with slower turn-around times. We will therefore be placing a very high priority on relatively fast turn-around times for ORiON as from volume 20 onwards – and to achieve this we will have to rely heavily on the support of all referees in this regard. For papers submitted in English, a period of 12 weeks for first readings will be our goal, and a period of 8 weeks for subsequent iterations, in the event that corrections are required. We plan to achieve these turn-around times by attempting to adhere to the following guidelines:

- Editor receives paper and sends it out to referees (1 week for manuscripts to arrive at referees)
- Referees receive paper and read (8 weeks for first reading; 4 weeks for subsequent readings)



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- Editor receives recommendations from referees (1 week for recommendations to arrive at the editor)
- Editor communicates revisions to authors (2 weeks for recommendations to arrive back at authors)

Papers may also be submitted to ORiON in any of the other 10 official languages of South Africa, but then the turn-around time will be considerable longer (at least double the times mentioned above), in order to allow us to identify suitable referees.

The reader will have noticed that the backlog of ORiON volumes that has built up over the past few years has now been eradicated with the publication of Volume 20. We hope that the new look of ORiON and the accelerated turn-around time of manuscripts will inspire OR practitioners to submit manuscripts of a number and quality that would enable us to publish the two separate issues per volume of ORiON regularly again in future. ♦

Open Source Software: “Can Software be free?”

By Neil Manson (*neil.manson@infotech.monash.edu*)

“How can software be free? I've always thought that there is no such thing as a free lunch.”

“Well, the word 'Free' in 'Free Software' doesn't mean the price. It refers to the freedoms that Free Software gives its users. However, many Free Software programs are also available at no cost.”

“What Freedoms?”

“The Free Software Foundation defines Free Software as software that is distributed under a licence that guarantees four basic freedoms. These are the freedom to run the program for any purpose; the freedom to study how the program works, and adapt it to your needs; the freedom to give away copies so you can help your neighbour; and the freedom to improve the program, and to make your improvements available to the public, so that the whole community benefits.

Essentially, Free Software is software that is distributed with the source code, so you can look at how it works, and make changes if you need to.”

“I've also heard of 'Open Source Software'. Is this different?”

“Yes, it is slightly different, but it is also the same in many ways. The main difference is that if you make a modification to a piece of Free Software, and distribute it, it must also be Free Software, but this is not a requirement of Open Source software.

Both of these are very different from traditional proprietary or Closed Source Software. Proprietary software producers generally keep the source code completely secret, and their licences explicitly prevent the user from attempting to change it, or from giving away copies.”

“So why is Free Software a good thing?”

“There are many reasons. Probably the main advantage of free software is the superior quality and reliability. This comes from the fact that you have many people looking at the source code. The more people who look at a piece of work, the more likely any mistakes or problems are to be detected.

Another big advantage is the development speed. Free software projects tend to release new versions fairly frequently which allow the developers to listen to their users, and rapidly incorporate suggestions and feature requests.”

“But doesn't that mean that the user has to upgrade their software often?”

“It can do, if you want to be on the leading edge, and always have the latest features. However, it doesn't have to. Many Free Software projects work in two branches, commonly called the stable branch, and the development branch. The development

branch releases new versions frequently so that users can test them and give feedback. These evolve quickly, but do tend to be a little unstable and buggy. The stable branch only releases new versions much less frequently, and they include changes that have been well tested and are working correctly. If you need stability more than the latest features, then you would use the stable branch.”

“What about some specific advantages?”

“Well, there are some specific advantages for developing economies, such as reduced dollar based costs, because most Free Software is available at no cost. Access to the source code also allows customization for local requirements. A good example of this is Translate.org.za who has translated the Open Office suite into Afrikaans, Zulu, Sepedi, and Tswana.

Another advantage for developing economies is the freedom from dependence on foreign suppliers. Because they have access to the source code, local suppliers and developers can support and enhance the products. This can result in a stimulation of the local IT sector, including development, support and training.

Also, it is part of the job of a government to store, manage and make available public information such as policy documents. The society will have much greater access to this information if it is available in a standard format that can be read by software that anyone can get.”

“You are a lecturer. How does free software affect your environment?”

“Obviously, one of the main factors is the cost, both for the school or university and for the students. There is also the reduced burden of license management. This is not just a theoretical problem. In the US, Temple University was fined \$100k and the LA Unified School District was fined \$300k for not complying with license agreements, not because they were deliberately trying to avoid license fees, but just because they hadn't managed it adequately.

A big problem in schools is viruses. However, Free Software, and particularly the Free Operating System GNU/Linux, is much less susceptible to viruses.

Also, having access to the source code can be used as a teaching tool. It is very useful for students to learn good programming techniques and practices by looking at the code that other professional programmers have written.”

“How does free software apply to Operations Research?”

“There are some repositories of Free OR software. The COIR-OR repository has a collection of optimization and other software. The GNU project also hosts a linear programming kit. There are also projects that have been released through general repositories such as the Distributed Simulation Object Library (DSOL) released on SourceForge.net.”

“What about support? If there is no company responsible for producing the software, who can you go to for support?”

“Support is an interesting issue. In some places you will read that support for Free Software is difficult to obtain, and in others you will hear that it is better than the support for proprietary software. The reason for this is that support for Free Software is available in a slightly different manner than what most people are used to in a proprietary environment. Support comes from the other users and the developers of the software through newsgroups, mailing lists and web forums. You have to go online and either ask a question, or search through previous questions and answers. It sometimes takes a little while, but you can almost always get the information you need. Often you can email the developers directly, and they will actually respond. A big thing about the support for Free Software is that you are not dependant on the original vendor, as you are with most proprietary software.”

“And security? Surely making the source code available to anybody makes it easier for the bad guys to find holes and vulnerabilities in the program?”

“Yes, it does, but at the same time it makes it possible for good guys to find holes and to fix them. As we’ve seen from proprietary software, the bad guys don’t need the source code to exploit holes. With Free Software you have many developers looking at the source code, so you have a much better chance that bugs will be found and fixed. Also, you are not dependant on the vendor to fix a discovered problem – which may take a while. Some time ago an exploit called the ‘Ping-o-Death’ affected both proprietary and free software. It took the proprietary developers months to release a patch, whereas the free software developers had a patch available within hours.”

“Isn’t it hard to use? I’ve always thought of Free Software as something used by programming geeks.”

“Yes, it used to be true that Free Software was hard. However

things have changed radically in the past few years. Most Free Software now comes with simple installers and easy-to-use graphical interfaces. Even the GNU/Linux operating system comes with a choice of interfaces, such as the Gnome Desktop that I am running here on my Linux box (see Figure 1).”

“This all sounds very good but surely there must be some problems with free software?”

“Yes, unfortunately there are. Many applications are still written by developers for other developers and are not that user friendly. Interoperability with other proprietary software can be a problem, although often it is not. Free Software doesn’t have the marketing effort that proprietary software enjoys, so many people don’t know about it. Also, because you get the software and the support from the Internet, you need a fairly good Internet connection, which is not available in many parts of Africa.

Although these are real problems, things have changed dramatically from where they were just a few years ago, and they will continue to change for the better.”

“I don’t think I’m ready to move to a free software operating system yet, but can I start using some free software in my Windows environment?”

“There are many Free Software programs that are available for Windows. For example, on my Windows box I use OpenOffice for writing documents, doing spreadsheet calculations and preparing presentations (see Figure 2). I use Mozilla to browse the web and to read email.”

“This all sounds very interesting. Where can I find more information, and where can I get some Free Software to try?”

“Well, I’ve set up a page with some links on the ORSSA website. It’s available at http://www.orssa.org.za/links/Free_and_Open_Source_Resources.html”

“Thanks a lot. I’m off to check it out. See you later.”

“Cheers!” ♦



Figure 1: The Gnome Desktop on GNU/Linux

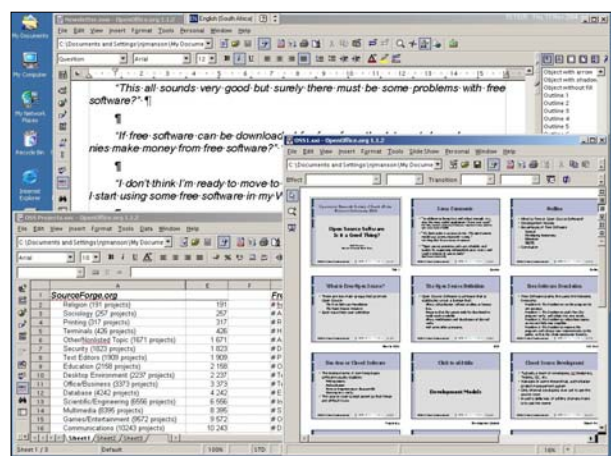


Figure 2: Open Office on Windows

BOOK REVIEW

By Hans Ittmann (*hittmann@csir.co.za*)



Community Operational Research – OR and Systems Thinking for Community Development by Gerald Midgley and Alejandro E. Ochoa-Arias (Eds.), 2004. Kluwer Academic Publishers B.V., New York, USA. pp. 366. ISBN 0-306-48335-1, USD 90.

The OR discipline has evolved over the years from being very mathematically oriented to the introduction of approaches to solving problems with no, or very little, mathematical content. The latter development took place during the 1960s and 70s when researchers started talking about “messes” and “ill-structured” problems. These problems were sufficiently ill-defined, or complex, making it impossible to represent in a mathematical form. Different approaches were developed to help clarify problem situations and to explore issues in a structured way. This was the start of what has become known as “soft OR.”

In parallel with this development, particularly in the UK, an increasing number of OR practitioners undertook OR-type work for a wide range of community, voluntary and charitable organisations. It was around this time, 1986 to be precise, that the term “Community OR” started to be used to describe these activities. Community OR is nowadays seen as a label that is used to describe the activities of “a variety of people engaged in the debate and on-going learning about their own and other people’s community development practices.” Why do people get involved in these activities? There are basically two reasons for this:

- people have a desire to contribute to change in communities; and
- Community OR practitioners have a concern with the design of methodologies, processes of engagement, methods and techniques that can be used in the interaction with communities.

Although the term “Community OR” was first coined in 1986, it is acknowledged that work in communities had already been done prior to that. It has now spread to all the regions of the world, noticeably also into developing countries. The future looks rosy mainly because of the sound foundation upon which Community OR has been built. The book *Community Operational Research* consolidates previously published literature on the subject and at the same time new articles are introduced with the aim to extend the boundaries of theory, methodology and practice. In total there are 14 papers or chapters, each one written by different authors. After the introductory chapter, the book is divided into three sections – each addressing specific aspects of the overall topic. Section one covers “Early Contributions and Later Reflections on

Theory, Methodology and Practice.” It addresses the nature of Community OR, its institutional development, what motivated people to engage in such projects while theoretical and methodological issues are also presented. Section two is titled: “Local Action for Community Development.” The chapters in this section illustrate the way in which theoretical insights of Community OR have been translated into practice and how practice has influenced theory. Lastly, section three is entitled: “Dealing Locally with Global Issues” and what is shown here is how Community OR has extended into two new directions. It is shown that Community OR has now also extended into developing countries, while there are many possibilities in the arena of environmental management.

Having introduced Community OR in the first chapter the editors then surface an issue that they believe is central to how the practice of Community OR should evolve through the influence of systems thinking. A long motivation and argument is presented on the importance of this. They make a strong case that a key issue in the practice of Community OR is comprehensiveness in planning. Other authors, noticeably Friend and Hickling (1997), do not support this view and they prefer the idea of selectivity. Using compelling reasoning the editors make the case that in essence there is no real difference between the different groups and that systems thinkers can indeed contribute significantly to Community OR practice.

The first chapter in Section one gives a very good overview of the history and development of Community OR. A number of examples of Community OR is mentioned, (for example, an action group opposed to the building of a new shipping centre; a campaign to improve the local environment, etc). In addition the authors ask a number of challenging questions about Community OR – many of these are still very relevant today. These include: “Is Community OR different from traditional OR?” and “Is Community OR often just community work?”

The next chapter, published originally in 1987, gives insight into the work of the Centre of Community OR at the University of Hull, UK. A critique of mainstream OR is given and it also links Community OR and systems thinking. What is interesting are the aims of Community OR as expressed in an invitation for proposals by the UK Operational Research Society:

- To extend awareness of OR to new sections of the community, thus broadening the range of clients;
- To demonstrate the relevance of OR to a wider range of problem situations;
- To enrich OR methodology and revitalise intellectual life through involvement in novel types of problem; and
- To contribute to improving the quality of discussion and decision-making in society at large.

The final chapter in Section one puts the focus on community, a word that differentiates the practice of Community OR from “mainstream” OR. Many choices of community environments are available and here three major political traditions

(liberalism, Marxism and communitarianism) are reviewed and the question is posed “what kind of Community OR practice would support each one?” Eight different forms of Community OR practices are identified and discussed.

Section two illustrates theoretical and methodological ideas with some very tangible and interesting real case studies. One of the latter is the classic case study “A Black Ghetto’s Research on a University” by Russell Ackoff. It describes how three community people were employed by the University and they, together with community representatives, developed plans for investment in new industries to benefit the ghetto. The OR practitioners received requests for aid and found ways to provide what was needed. This is possibly one of the first real Community OR applications, it was originally published in 1970, and it was hugely successful.

A number of other case studies are described in this Section. There is a housing project in the Dearne Valley in the UK. This is a fascinating project with many lessons learnt, all of which are reflected upon and presented in detail. Strategic planning with a Council for Voluntary Service (CVS) is the topic of another case study. One of the key points in this project is how the authors addressed simultaneous strategic planning issues and tensions between various people on the CVS that championed different view points. Facilitation is one of the key aspects in all of the projects described in this section and one chapter is devoted to facilitation as a tool in fair intervention. One of the well known practitioners of Community OR, John Friend, presents some perspectives of engagement in Community OR and in this paper he elaborates on two different theories about what it means to engage in Community OR. This is one of the characteristics in the book where both practice and theory are presented, and it is shown how these build on each other.

One of the most interesting projects was the one where efforts were made to provide interventions through developing services with young people living on the streets. In depth descriptions are given on how the project team approached and work with the young people and stakeholders. The young people are, in fact, children under 16 but the team was careful to refer to them as “young people” in an effort to gain their confidence and to show them the necessary respect. This illustrates the detailed effort and planning on the project. “Participatory appraisal of needs and development of action” (PANDA) is an approach which was developed to use metaphors in practice. It is another fascinating chapter on the use of metaphors in interacting with communities or groups.

In Section three there are three chapters which endeavour to show how Community OR can be extended into new areas. One of the areas where Community OR may potentially make an enormous impact is in addressing problems in developing countries. Community involvement in Venezuela with a local community association that acts as both a public service watchdog and a campaign group is presented. Given the political situation in that country the involvement has a strong political connotation, and it is an illustration of Community OR that embraces the raising of political consciousness. The last

two chapters discuss environmental issues and their interface with social concerns.

For those not familiar with Community OR this is a great book that integrates both the theory with practice. It is, however, not an “easy” read, but a demanding book and the reader will need to spend quality time in going through it. Nevertheless it is hugely informative and everyone that reads this will be able to benefit. Jonathan Rosenhead, the “founder of Community OR,” is quoted as follows about Community Operational Research: “This is the book I have been waiting for: Community Operational Research has shown that analysis can be used not only for, but also with, community groups, helping them to gain more control of their situation. What Midgley and Ochoa-Arias’ volume does is provide not only rich examples of grass-roots practice, but also thought-provoking theoretical explorations. The editors have a point of view, but they allow space for debate with those who interpret Community OR differently.”

Reference

Friend, J. and A. Hickling, 1997. Planning under Pressure, 2nd edition, Butterworth-Heinemann, Oxford. ♦

Kluwer has sponsored a copy of **Community Operational Re-Search: OR and Systems Thinking for Community Development**. This copy can be won by a fully paid-up ORSSA member that answers the following question correctly:

How is the classic case study by Russell Ackoff titled?

The winner will be randomly selected from the correct entries. Please e-mail your answer and contact details to the editor at pottie@dip.sun.ac.za. The winner will be announced in the next issue.

The book **Decisions by Objectives** by Prof Ernest Forman is available for reviewing. It deals with practical management decision making and the AHP. If you are interested, please contact the editor.

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ORSSA AND IFORS/EURO

By Theo Stewart (*tjstew@stats.uct.ac.za*)

ORSSA is a member of both IFORS (the International Federation of Operational Research Societies) and EURO (the association of IFORS member societies in Europe). Membership of IFORS would not be surprising, but what's this about Europe? Is this some reactionary Eurocentric tendency on the part of the ORSSA committee? The purpose of the present article is to elaborate on these relationships, and to provide information on the benefits of these memberships for ORSSA.

Our society became a member of IFORS in 1973, following the attendance by some of our members at preceding IFORS triennial meetings. IFORS is an association of OR societies, aimed at encouraging international collaboration in OR and providing seed money to leverage the development of OR worldwide. Of particular importance to ORSSA is the developing countries committee of IFORS, to which IFORS devotes about 17% of its operating budget. This activity is specifically aimed at the stimulation of the use of OR in developmental problems and in the developing world. South Africa plays a leading role in this aspect of IFORS, with the present writer chairing the committee (in his capacity as vice-president of IFORS), Hans Ittmann editing the developing countries newsletter, and Paul Fatti chairing the development prize awards committee linked to the 2005 triennial meeting. Incidentally, South Africa (through Jan van Vuuren of Stellenbosch) has been runner-up for this prize at the last two triennial meetings – so come on folks, submit something to make it third time lucky!

The EURO organization started quietly in 1976 as a means to organize additional annual international conferences on OR (to be held in Europe), in the years between the IFORS triennial meetings. This organization then developed rapidly, introducing a variety of instruments such as prizes, sponsorship of working groups on specialized topics, and sponsorship of summer and winter institutes to bring together young researchers in OR. These activities provided the stimulus for the creation of other regional groupings in Latin America and in the Asia-Pacific region.

In 1987, IFORS agreed to a re-organization of its statutes to give more formal recognition to these regional groupings. In particular, there would be a vice president for each region, in addition to one “vice president at large” without regional affiliation. Three regions existed at that time, namely EURO, ALIO (Latin America) and APORS (Asia-Pacific). A North American region (consisting of the USA and Canada) was formally created, although it has never had much identifiable activity in its own right, apart from electing one vice president between INFORMS (representing the US) and the Canadian OR Society (CORS).

This left ORSSA in an anomalous position. Egypt, Israel and Turkey became members of EURO, so that ORSSA remained as the only member society of IFORS without link to a region and regional vice president. Much discussion ensued. Some in ORSSA argued that we should try to affiliate to ALIO as it was more of a developing region, but cross-Atlantic contacts were difficult at the time, and there were also language barriers. Thus, EURO seemed our more natural regional home,

especially as the only other African member of IFORS belonged there. In the political climate of the time, however, there was resistance from some EURO member countries to admitting South Africa (even though ORSSA had maintained an open membership policy from the start).

I was, nevertheless, delegated by ORSSA to continue discussions with the EURO council, and at the 1992 EURO meeting in Helsinki, the way was cleared for ORSSA formally to apply for membership in EURO, which was approved in the following year.

EURO remains far and away the most active of the IFORS regions, and ORSSA members have access to many of the EURO activities. Rather than to attempt to summarize the EURO activities and instruments here, I would urge members to visit the EURO web-page at www.euro-online.org. In fact, EURO encourages individual members to register on their web-site, to ensure that they receive timely information concerning EURO activities. Nevertheless, it is worth directing the reader's attention to the following at least:

- The EURO conferences which take place in the years between the IFORS meetings: Attendance may be anything between 700 and 1500 delegates, and a wide range of topics are covered. The social events are well-structured to facilitate networking, out of which I personally have developed many long-standing contacts.
- The EURO working groups: There are currently 27 such groups, bringing together small groups of researchers interested in a specific Operational Research topic. EURO provides an organisational framework and some seed money, so that these groups can run newsletters, web-pages, etc., as well as meeting together at least once a year. For the young researcher in OR, this is an excellent means of keeping abreast of the field and contact with others of like interests.
- EURO Summer and Winter Institutes: The basic idea is that around 20 young (approximately between 25 and 35 years of age) researchers all having an unpublished paper within the theme announced, can meet for about two weeks, present their material, discuss it with others and with a handful of specially invited senior experts in the field, and finally prepare a paper to be considered for inclusion in a feature issue of EJOR. It is worth noting that the IFORS developing countries committee does provide travel scholarships for potential delegates from developing countries.
- EURO awards and prizes: EURO also recognizes outstanding work by operational researchers in member countries, by means of their gold medal, a doctoral dissertation award, and prizes for excellence in practice and for strategic innovation in identified areas. ORSSA members are in principle eligible for any of these awards.

Finally, of particular relevance to ORSSA's membership of EURO has been the organization's Africa outreach over the past few years, which has led to a number of OR conferences in Africa with support from EURO. This activity has been strongly driven, inter alia, by Alexis Tsoukias who takes office as EURO president in January, and can thus be expected to continue. We need to continue to work with EURO to realize this African potential. ♦

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SAS SOFTWARE USED TO IMPROVE DESERT LOCUST MONITORING AND FORECASTING

The International Association for Applied Acridology (the study of grasshoppers and locusts) is using SAS solutions – from SAS Institute SA – to determine which plant habitats in the desert region of Mauritania in North Africa most favour locust communities.

According to Jeffrey Lockwood, director at the association, the ability for any single nation to sustain a critical mass of expertise in grasshopper and locust pest management has diminished, yet the quality of geographically dispersed experience and knowledge is extremely high.

The association brings together the world's leading Acridology experts to develop and provide unbiased analyses, along with culturally, technologically, economically, and environmentally appropriate methods, for managing locust and grasshopper outbreaks.

Grasshopper and locust outbreaks reduce standards of living, displace human populations, induce famine, and erode environmental quality. To combat this, the highest level of practical expertise and experience is essential to rapidly build the capacity of agricultural communities to implement safe and effective prevention and control programmes.

A database was developed with 241 variables and over 20 000 records, containing detailed information on locust occurrence, insecticide applications, plant habitat, meteorology, landscape and soil parameters.

The association says that understanding where and when locusts are most likely to occur will lead to a better understanding of locust ecology and an improvement in locust management.

It believes that focusing survey and control operations to those areas will lead to a reduction of survey costs and potential reduced pesticide use through more precise control operations.

SAS software was selected to maintain the database because of its high quality and flexibility in analysing complex datasets, its relative simplicity and the wide availability of SAS programmers.

SAS sets itself apart from other software packages in that it can debug data with extreme ease. In addition, it provides a detailed log of all analytical steps so that errors in programming can be detected and it has the capacity to unravel complex relationships with relatively simple programming.

The SAS licence was obtained through the SAS regional headquarters in South Africa in 2001. Initial steps focused on debugging the existing database because a number of erroneously entered records that had slipped through previous proof reading rounds were easily identified using summary statistics.

A spatial component was then added to the analysis by using SAS code to create a grid of cells, each measuring approximately 50 km by 50 km. Each geo-referenced observation is assigned to a particular cell.

In a preliminary analysis, counts of gregarious locusts were totalled by grid, month, and year and regressed against presence counts of 68 different plant species.

It was found that some species of plants do not appear to have any impact on locust abundance and these may be ignored during surveys. However, analysis is continuing, and the next step will be to relate locust and host plant abundance to soil and meteorological parameters such as rainfall, relative humidity, soil moisture and soil type in areas where these measurements were taken.

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