

INSIDE O.R.

DECEMBER 2014 NO 528



THE ADVERTISING INDUSTRY NEEDS MATHS MEN AND MAD MEN

::: INSIDE THIS MONTH :::::

TIME AND TIDE

O.R. IS UNDEAD

THE VOICE OF O.R.

SUSTAINABLE FARMING



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DIAMOND JUBILEE

60 YEARS OF BETTER DECISIONS

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EDITORIAL

JOHN CROCKER

In this month's Y2OR section, Louise has included another puzzle for your amusement over the Christmas break. As with so many O.R. problems, there is no single solution to this problem: do you go for the solution which minimises the variance among the electoral sizes or the one which maximises the length of the internal boundaries and hence produces the most compact constituencies. By coincidence, Cyril Smith talked about some of these issues at the 1984 Conference (see OR minus 30).

In John Hopes' Leader, he talks about O.R. having a voice or an opinion. As he says, it is a good many years since a group of O.R. people (an appropriate collective noun might be a 'procrastination' or 'indecision' of O.R. analysts) spoke with one voice on a subject of international or even national importance. One of the problems is that whilst we are very good at finding optimal or near optimal solutions to problems, as with the one above, there are usually several viewpoints. As an example, in Professor Vlachos' paper (see 'Sustainable Farming' ibid) he refers to four inter-connected domains: ecology, economics, politics and culture. A 'solution' which optimises against any one of these four will, almost inevitably be sub-optimal against the other three: a solution which recommends intensive farming will no doubt upset the ecologists; one which recommends large-scale amalgamation into collectives may not be culturally acceptable and so on.

We tend to see problems (or messes) from many different angles: 'you can please some of the people some of the time but you cannot please all of the people all of the time'. This makes it particularly difficult to find a group who will agree to speak with one voice. Ironically, it is also one of the things which make us particularly suited to the role of O.R. analyst – the ability to see things from different perspectives.

Talking of different perspectives, James Lovelock, in his latest and (at 95) possibly last book, *A Rough Ride to the Future* published this year by Allen Lane (Penguin Group) (ISBN 978-0-241-00476-0) now believes that the Earth has, in effect, a mission to sustain some form of life for as long as possible. He says that global warming is inevitable and that it would be better for us to adapt by building cities (nests) that can be kept cool at minimum energy cost (a la termites) while we work to develop a non-wet-carbon life-form – probably silicon based. As far as Earth (or perhaps, more correctly, Gaia) is concerned, it just needs to ensure that Man remains around long enough to develop this silicon-based life-form that will be able to survive and thrive in temperatures that are likely to become significantly higher than today and eventually, higher than a wet-carbon life-form can tolerate. The arguments are compelling, but is this the best future we can hope for? If it is not, is there anything we can do to stop it happening or, at least, slow it down? In many ways, O.R. is at the forefront, much of our work has been to find ways of replacing expensive, demanding, inefficient humans with silicon-based technology. As always, I would love to hear your views.

Finally, congratulations to all who have been elected to serve on General Council and the Board of Directors and particularly to Ruth Kaufman who is destined to become our next President in 2016 after serving a one-year apprenticeship as President-Elect. Ruth has served on Council, the Board and as Chair of the Publicity, Membership and Website Committee for a good many years and is very passionate about O.R. but I am sure the Society will do its best to cure that over her two year reign!

May I also be one of the first to wish you all a very happy Christmas (even if that is politically incorrect). **<OR>**

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TIME AND TIDE

NIGEL CUMMINGS

Maritime shipping is responsible for around 3.3% of the total amount of greenhouse gas emissions. In an effort to reduce such emissions many maritime agencies have enforced a 'slow steaming' approach voluntarily to help reduce fuel consumption and greenhouse gas emissions.



Emel Aktas

The adoption of such a method has only been partly successful because there are occasions when port access times are uncertain and there is a need to make a trade-off between speed of transit and efficiency of fuel consumption to deliver goods to their targeted destinations and achieve successful service levels.

In their paper presented at OR56, Emel Aktas (Cranfield University) and Afshin Mansouri (Brunel University) described the work they have done on managing trade-offs between fuel emissions and service level in maritime transportation with uncertain port times.

Before a ship can dock at a port, it will need a free berth. It may also need a pilot, one or more tugs and a given minimum depth of water which could depend on the tide. Loading and unloading also require certain dockside equipment which may not always be available. Ocean-going liners have to operate to a timetable so if they are delayed at one port, they will need to make up the time which means increased speeds which, alas, results in higher fuel consumption and hence higher emissions.

The aim therefore is to minimise fuel emissions but, at the same time, maximise service level where port times were uncertain. After considerable research Aktas and Mansouri decided it was a problem best dealt with by the application of a complex stochastic, multi-objective, optimisation procedure using simulation to generate the Pareto frontier. They validated their model using real data taken from two liners in the Pacific Ocean and the Mediterranean.



Afshin Mansouri

Complications were added because their work had to encompass the variability caused by uncertainty of port times and tightness of arrival times – these were the two key factors that affected service level and fuel consumption.

Working with this data, they were able to generate datasets which accounted for a wide range of combinations of these two factors. Their findings confirmed that the level of uncertainty in port arrival times was a key factor affecting service levels and that speeding decisions became less effective under high port uncertainties. They also found that the problem was more critical for shorter routes where the contribution of port time to the overall journey time was significant.

This work took into account, the sensitivities of the two objectives to solving this type of problem and the end result was to provide managerial advice for liners and port operators to assist each other in achieving efficiency of delivery of goods port-to-port whilst retaining 'good greenhouse gas levels' and in many cases reducing the expected amount of greenhouse gas generated to a measurable extent.

The presentation of this paper was captured on video and can be viewed from links available on the Operational Research website.

Analytics to the rescue

The West African Ebola virus outbreak has claimed more than 10,000 lives. Emergency response teams struggle to provide aid, but big data analytics could provide help.

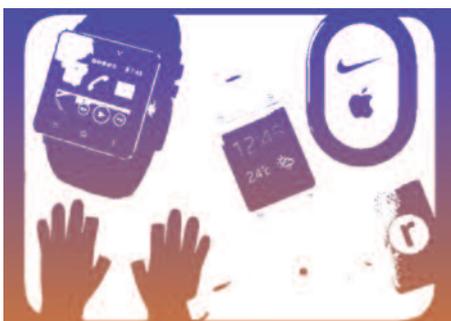
Orange Telecom in Senegal have handed over anonymised voice and text data from 150,000 mobile phones to Flowminder, a Swedish non-profit organisation, which has been able to draw up detailed maps of typical population movements in the region. Authorities can use this data to see where the best places are to set up Ebola treatment centres and target more effective ways to restrict travel to contain the disease.

Increases in calls to helplines from one particular area suggest an outbreak and this alerts authorities to direct more resources there. The level of activity at each mobile phone mast also provides a 'heatmap' of where people are and how far they are moving.

More information on this can be found at: <http://usat.ly/1wuHNKw>

Biolitics?

Yes Biolitics! It is a term being applied to wearable devices and their apps. Wearable tech and their apps present an enormous big data opportunity. The data from the sensors can be analysed in real time to provide information that will be useful in monitoring for diabetes, heart rate, blood pressure, adrenaline levels etc. Such sensors can detect body chemistry changes via the wearer's skin and report to health professionals automatically. This could speed up the alert and application of life saving interventions – all this is at the heart of Body Biolitics' future business model.



For more on this topic see: <http://zd.net/1vsfo8n> and wearables solution prototypes predictive analytics via @ZDNet @greentechlady <http://zd.net/1nzUQKa>

Beauty may only be skin deep

Whilst damage to the metal skin of an aircraft is fairly obvious just by looking at it, the same is not the case with composites. The surface may appear completely undamaged but, de-lamination and fragmentation under the skin may seriously compromise its strength.



Silvestre Pinho, leading the EPSRC funded research at Imperial College London in cooperation with Airbus, has developed a computer model for accurately predicting how composites components in modern aircraft design behave after sustaining minor damage. It is hoped that this work will lead to lighter components which would result in significant fuel savings. The A350, shown, comprises 53% composites, by weight see <http://bit.ly/1ujuFsp>

Infrastructure Security

EPSRC funded research being carried out at under the lead of Professor Awais Rashid, Director of Lancaster University's Security Lancaster Research Centre, as part of the MUMBA Project, will provide tools and insight that enables decision makers to more effectively counter the risks posed in protecting critical infrastructure from cyber-attack over the extended life of these systems.

The 'MUMBA' project is specifically focused on threats to 'industrial control systems',

which manage key infrastructure such as manufacturing plants, power stations, electricity grids, and transport networks see: <http://bit.ly/1u8ZYo9>

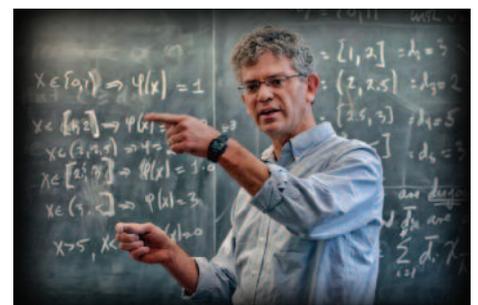
SORT IT

A supplement entitled, 'Tuberculosis and drug-resistant tuberculosis in Eastern Europe: Operational Research from the SORT IT Programme, 2012–2014,' has just been published in the open access journal Public Health Action.

The 11 research studies published in the supplement were conducted through the Structured Operational Research and Training Initiative (SORT IT). The WHO Regional Office for Europe together with WHO-TDR is leading the SORT IT Programme in Eastern Europe in collaboration with Médecins Sans Frontières (MSF) and the International Union Against Tuberculosis and Lung Disease (the Union). More at: <http://bit.ly/1qHylte>

Climate Chaos?

Victor Donnay, a Professor of Mathematics once created a lesson in which he could explain the mathematical concepts that lie at the core of climate change. 'Think of a standard pool table as the earth being in balance,' Said Donnay. 'As CO2 levels rise, changes are made to the system, in this case the shape of the table. When the system is in balance, the billiard balls move in predictable patterns. However, if certain changes are made, chaos reigns and the movement of the balls become much more unpredictable.'



These comments struck a chord with the producers of the TED-Ed videos in May 2014; the result of the collaboration can be accessed via: <http://bit.ly/1GVBiPZ>

Unsociable hours impairs cognition

A new study published online in the journal Occupational and Environmental Medicine reveals that individuals who have done shift work for more than 10 years, show a decline in cognitive performance equivalent to an extra 6 ½ years of ageing.

Shift work, like jet lag, is known to disrupt workers' normal circadian rhythms and social life and to be associated with increased health problems (ulcers, cardiovascular disease, metabolic syndrome, breast cancer, reproductive difficulties) and with acute effects on safety and productivity. Until now, very little was known about the long-term consequences of shift work on cognitive abilities. The aim of this study was to assess the chronicity and reversibility of the effects of shift work on cognition

More information at: <http://bit.ly/10QCCdi>

The Imitation Game

The biopic of computer scientist and Enigma code breaker Alan Turing began showing in UK cinemas on 14 November 2014. The Imitation Game has been mooted as a contender for the Oscars 2015. This British-American thriller is about British mathematician, logician, cryptanalyst and pioneering computer scientist Alan Turing, a key figure in cracking Nazi Germany's Enigma code that helped the Allies win World War II, only to later be criminally prosecuted for his homosexuality, chemically castrated and driven to an early death by suicide in 1954.

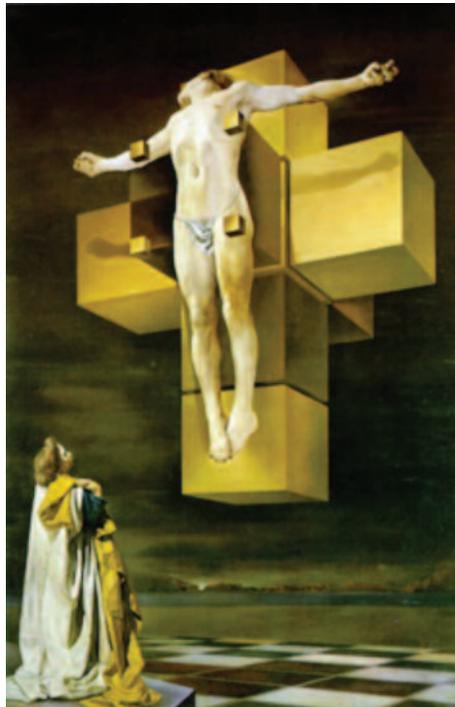


The film depicts the race against time by Alan Turing (portrayed by Benedict Cumberbatch of Sherlock and Star Trek fame) and his team of code-breakers at

Britain's top-secret Government Code and Cypher School at Bletchley Park, during the dark days of World War II. His heterogeneous group of scholars, mathematicians, linguists, chess champions and intelligence officers had a powerful ally in Prime Minister Winston Churchill who authorised the provision of any resource they required.

Painting by numbers?

Surrealist painter Salvador Dali used his gift for mathematics to create images which displayed seemingly impossible perspectives. In his quest for eye catching effects, Dali enlisted the help of mathematicians to work with him on images relating to four dimensions. His 'Crucifixion or Corpus Hypercubus' (1954) is a surrealist image of a crucified Christ pinioned to a four-dimensional hypercube.



From an early age, Dali was a voracious reader of science and maths texts. In 1935 he described himself as a fish swimming between 'the cold water of art and the warm water of science'. For more detailed information on this: please see: <http://bit.ly/1vbw05Z>

The everything store

A perfect stocking filler at a pocket money price which will inform and delight anyone interested in the history of Amazon and its founder, a bookseller called Jeff Bezos. Mr Bezos will go down in history as the man who brought seductive convenience and disruptively low prices to the online marketplace with his development of the system we now know as Amazon.

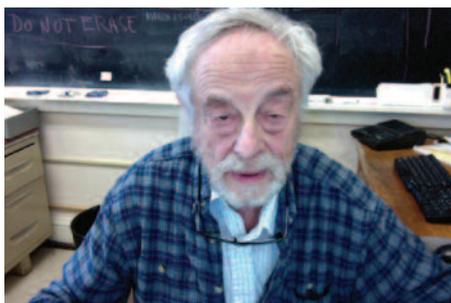


This book written by Brad Stone was winner of the 2013 Financial Times and Goldman Sachs Business Book of the Year Award and is available, yes, you've guessed it, through Amazon for around £7 (pbk), £15 (hbk) or £3.50 (ebk). It spans over 450 pages, is published by Corgi ISBN-10: 0552167835 and ISBN-13: 978-0552167833

Hans Schneider (1927-2014)

Hans Schneider was born in Vienna, gained his doctorate from Edinburgh, taught in Belfast and became the James Joseph Sylvester Professor at the University of Wisconsin-Madison. He was the first president of the International Matrix Group (1987-1990) and its successor, the

International Linear Algebra Society (1990 – 1996). Schneider was a founding editor (1968-1972) and then editor-in-chief of Linear Algebra and Its Applications (1972 - 2012) and an Advisory Editor of the Electronic Journal of Linear Algebra.



Schneider was aware that, in the 1950s and 1960s, linear algebra was a 'dead subject, which all mathematicians must know, but

hardly a topic for research.' he saw the field 'as an essential ingredient of many mathematical areas.'

The development of Google would not have happened without this basic knowledge in linear algebra and matrix theory. He published more than 160 papers.

Fame at last

theguardian

I'm sure no-one would disagree when I say we'd like to see more of O.R. in the mainstream press. Well, we got a tiny bit of exposure in The Guardian on Monday 27

October, thanks to Chifonie:

14 across: Lawyer's writing edited by operational research (10)

Okay, so it's perhaps not quite as much of the media spotlight as we'd like, but as Tesco say....

The answer to the cryptic clue is: PROSECUTOR – PROSE (writing) CUT (edited) OR (we all knew that part), meaning a lawyer.

Correction

In the October Issue (page 6) we inadvertently attributed some optimising software to QinetiQ. The actual software being used by KLM has been developed by Quintiq. Please accept our apologies for this error.

: : : : : IN BRIEF : :

ELECTIONS TO BOARD & GENERAL COUNCIL

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

I am delighted to announce the results of the recent call for nominations to Board & General Council.



Ruth Kaufman has been elected to the Board and General Council as President-Elect. She will serve one year in this role from 1 January 2015, followed by two years as President in 2016 and 2017, and wind down during 2018 as Past-President.

The following members have been elected to General Council, to serve for three years from 1 January 2015:

Suchi Collingwood, *Dept. of Health*, Regional Member – London & South East

Brian Dangerfield *, *University of Bristol*

Alberto Franco, *Loughborough University*
Salvatore Greco, *University of Portsmouth*
Chris Kirkbride, *University of Lancaster*, Regional Member – North West
Ian Mitchell, *Dept. for Business, Skills & Innovation*
Frances O'Brien *, *Warwick Business School*
Jane Parkin *, *Independent*, Regional Member – Yorkshire & Humberside
Alex Sheen, *University of Portsmouth*, Regional Member – South
Dan Tilley *, *NSC*
Kees Van Haperen, *VH2 Ltd*
Julie Vile, *Cardiff University*, Regional Member – South Wales

* Renewed for a second term.

There being no more than one nomination for any vacant post, there will be no elections this year and the above are therefore returned unopposed.

I would also like to thank, on behalf of the Society, John Albiston, Tim Bedford, David Lane, Thanos Papadopoulos, Geoff Royston, Jo Smedley, Aris Syntetos and Mike Wright for their time served on Board and General Council.



Learning and Development 2015

Programme of approved courses in O.R. and Analytics

5 March	Facilitation Skills
10 March	Essential O.R. Skills for Practitioners
10-11 March	The Collaborative Approach to Simulation Model Building
11 March	Organising and Presenting Data In Excel
12 March	Improving Quality and Performance with the public sector scorecard
25 March	Using Soft Systems Methodology
26 March	Practicing Soft System Methodology
30 March-1 April	Simulation: A Practical Guide to Developing and Using Models
20-24 April	Introduction to O.R. I
6-7 May	A Strategic Choice Approach to Problem Structuring
12 May	Designing Performance Measurement Systems using Analytics
13 May	Using System Dynamics in your organisation
19 May	Decision and Risk Analysis
20-21 May	Supporting Strategy
2 June	The Science of Data Visualisation
3 June	From Big Data to Open Data
4 June	Actionable Intelligence
24 June	How to engage key stakeholders in your project
2 July	Performance Management with DEA
14 July	Data Mining: Techniques & Applications
15 July	Data Mining: Advanced Data Mining
16 July	Introduction to measuring and demonstrating impact in complex systems
9-10 September	O.R. and Supply Chain Management
17 September	Process Optimisation and Anti-Fragility: Friends or enemies
21-25 September	Introduction to O.R. II
6 October	Introducing Social Media for Researchers and Consultants
27 October	Practical Process Improvement using Lean and Six Sigma
28-29 October	Managing Successful Analytical Projects
3-4 November	Agent Based Modelling: What, When & Where

**For details of all courses and to book online, visit
www.theorsociety.com
or call Jennie Phelps on 0121 234 7818**

BEALE LECTURE 2015

THE OR SOCIETY

THURSDAY 26 FEBRUARY 2015

MIDLAND HOTEL, MANCHESTER

The OR Society's Beale Medal is in memory of the late Martin Beale and gives recognition to a sustained contribution over many years to the theory, practice, or philosophy of O.R. in the UK, or to some combination of those areas.

The Beale Lecture is a free event and begins with a short talk from our 2012 Doctoral Award winner, Kabir Rustogi, followed by our main speaker and 2013 Beale Medal winner, Kevin Glazebrook.



Kabir Rustogi will speak on his PhD paper: Scheduling with Changing Times and Rate-Modifying Activities. His abstract can be found at www.theorsociety.com/beale2015

Dr Rustogi is a Senior Lecturer of Operational Research in the Department of Mathematical Sciences of the University of Greenwich, London. He received his Ph.D. from Greenwich in 2013. He won the PhD award for his work on machine scheduling with changing processing times. He has published his work in several high impact journals and is widely cited.

'The speaker will highlight a personal connection with Martin Beale and will draw lessons from it.'



Kevin Glazebrook was awarded the Beale Medal in recognition of his article: 'O.R. research in UK universities – where do we go from here?'

Ten years ago EPSRC commissioned a report *Review of Research Status of Operational Research in the UK* which was conducted in partnership with EPSRC and the OR Society. This

review has exercised a potent influence on research council thinking about O.R. research over the last decade and key investments trace their origins to it.

The lecture will reflect on some of what has been accomplished over the last decade, (and what has not), along with the challenges/opportunities which face O.R. research in the academy ten years on when research impact counts. The speaker will highlight a personal connection with Martin Beale and will draw lessons from it.

Kevin Glazebrook is a distinguished Professor of Operational Research in the Department of Management Science at Lancaster University. With a PhD in Mathematics from Cambridge University in 1976, he worked for many years in the School of Mathematics and Statistics at Newcastle University. In 2002 he moved to Edinburgh as Professor of Management Science and in 2005, joined the Dept. of Management Science, Lancaster University.

ARMAGEDDON

NIGEL CUMMINGS

More than 300 megatons of 'hypothetical' nuclear bombs were detonated over Britain, in the space of a 16-hour computer modelled exchange, thanks to a 'secret' Home Office exercise which took place during 1982.



The exercise was designed to test the UK's capacity to rebuild order and infrastructure after a nuclear attack, and yes, WE were involved with it!

Files recently released at the National Archives detail one short-lived proposal issued from the Government's Operational Research Unit of that time, to recruit psychopaths to help keep order in the event of such an event.

The exercise saw many cities flattened, millions of fatalities from the blast and millions more suffering from radiation sickness. In bunkers there were 12 regional commissioners with their staff, ready to come out and take charge.

It focused on one central region covering Derbyshire, Leicestershire, Lincolnshire, Nottinghamshire and South Yorkshire. The model simulated the resulting deaths and damage following the detonation of a number of bombs at the most likely points over this area. Scientific advisers of that time estimated that 50% of the country would be untouched though many survivors would be affected by radiation.

When planning the war game, a scientific officer in the Home Office, was tasked with imagining how law and order would be maintained. Her imaginings led to a belief that police would be too busy helping 'inadequate' people in disaster-struck areas, so suggested that another group could be recruited to help keep order.

'It is... generally accepted that around 1% of the population are psychopaths. These are the people who could be expected to show no psychological effects in the communities which have suffered the severest losses. [They are likely to be] very good in crises as they have no feelings for others, nor moral code, and tend to be very intelligent and logical'.

Her bosses were not convinced believing such people would be dangerous whether or not recruited into post-attack organisation. As a result, the simulation was run without enlisting the services of neighbourhood psychopaths. Even without their help, the model indicated that vigilante groups would emerge after a few weeks to challenge the authorities. The report does not indicate how the psychopaths would have been identified but one does wonder how many of them might have become the leaders of these vigilantes!

In May 1982 at a training centre in Yorkshire some officials tried to play the game but the consensus was that it failed to go far enough, getting too bogged down in the preliminaries. (Perhaps in the next release from the National Archives, we shall see how the psychopaths had already been encouraged to become political leaders – remind me again, who was Prime Minister in 1982? *Editor*)

<OR>

EVENTS WORLDWIDE

To see the full listing go to:

www.theorsociety.com/Pages/NonSociety/NSEvents.aspx

O.R. IS UNDEAD

NIGEL CUMMINGS AND JOHN CROCKER

Over the years, O.R. academics and even practitioners have produced many games and scenarios aimed at introducing optimisation methods in an interesting and reasonably realistic manner.

Management games were very much in vogue in the 1970s and 1980s and are, no doubt, still in use on many courses. The problem is that whilst many optimisation methods are very powerful, they can be very tedious to perform manually. For most methods, there are packages available which removes a great deal of the effort but these are usually 'black boxes' which show none of the working. In many cases, the solutions may be sub-optimal either because it has homed in on a local minima or because it has run out of time or iterations. This may not always be obvious to the user who is unfamiliar with either the technique or the package. At the same time, most problems encountered in real life do not come with a label telling the analyst which method to use. A gaming approach can help make the problems more interesting and develop a better understanding of when and how to apply the various methods.



Dr Ivan Guardiola, Associate Professor of Engineering Management and Systems Engineering, Missouri University of Science and Technology has devised a scenario entitled 'Zombie Apocalypse: Optimising Survival' in which the students have to solve a number of optimisation problems in order to ensure the survival of themselves and the maximum number of the other students on campus.

The students are given a manual which guides them through a series of situations and options that require them to determine the best choices for their own and their classmates' survival. Dr Guardiola adds that the students' optimal solutions attained in each section impact the next section and, more importantly, the goal ... to maximise the number of survivors.

The course was structured to convey optimisation principles to students and promote the discussion of how well actions and analyses met their goal to improve learning. A survey of students at the end of the course showed that most thought the approach helped them learn the subject and students on average made better grades in the 2012 course than those in previous years.

In his journal article, published in the September 2014 issue of *Quality Approaches in Higher Education*, Dr Guardiola writes. 'Overall, through something as simple as a story line, students felt more engaged and came to class with many questions regarding formulation techniques, solution methods and interpretation of



results.' He said that the idea for creating the zombie doomsday scenario occurred to him at a time when 'Shows like 'The Walking Dead' were really popular, and I thought the 'zombie apocalypse' story line had all the elements of a case study to teach students the management science techniques of this course.'

The scenario unfolds with an army of zombies approaching the campus. The students have to decide whether to stay and fight or flee. They will lose a certain percentage of the students if they flee. If they stay they can use a number of defensive tactics such as cutting a fire moat or turning empty vehicles into bombs each with its own kill-rate and costs, in terms of labour and time.

Another scenario requires students to calculate the best route to relocate to a safe place, in this instance, a small town about 60 miles away. The students who completed the course, 'had mixed opinions when it came to time and value, as many believed it took more time than it was worth,' though Guardiola still believes the project was a success.

Dr Guardiola, describes himself as 'a fan, to some extent,' of the zombie genre.

More info can be found at: <http://news.mst.edu/2014/10/how-engineering-could-help-you-survive-a-zombie-apocalypse/> and <http://web.mst.edu/~guardiolaiguardiolai@mst.edu>

A ROSE BY ANY OTHER NAME

NIGEL CUMMINGS

The discovery and communication of meaningful patterns in data utilising statistics, computer programming and O.R. is now more widely known as Analytics.

The OR Society has embraced analytics fervently in recent years because it expresses, up to a point, where we are at, why we are different from other 'sciences' and what we do.

Some members and outside observers have even been so bold as to suggest that we, as a Society, 'drop' the term Operational Research, and instead opt for a simpler and perhaps more publicly acceptable title of the 'Analytics Society'.

In view of the current fervour engendered by analytics, which may after all, be just a fad, and the obvious interest and support by the O.R. community, OR Society president, Professor Stewart Robinson, decided to put forward his personal views and experiences of analytics and O.R. to try to define what analytics meant and to ask the question, should we change our name to the Analytics Society?

Throughout an animated and energetic presentation Professor Robinson kept his audience enthralled and enrapt, with his infectious enthusiasm for O.R., Analytics and the similarities they shared. There was much in common between analytics and O.R., but there were also strands that bore little relation to the O.R. field.

He asked what does this mean for us as O.R. practitioners and academics? What does this mean about the relationship between O.R. and analytics and, what does that imply for us as a field and how are we to progress O.R. alongside analytics?'

In answering such questions, he drew comparison with the processes that occur in O.R. and Analytics. He said that analytics made extensive use of data, statistics and qualitative analysis, explanatory and predictive models and fact-based management to arrive at decisions and actions, and he added that he did not feel, 'uncomfortable as an O.R. person in saying that is what O.R. does too.'

O.R. in many respects 'had very much the same idea as analytics', as it involved extensive analysis of data, statistics, quantity and predictive models to drive decisions and actions. Like analytics the results from Operational Research analysis could be input for human decision making processes or integrated into fully automated decision systems.

Where analytics was 'new', lay in its ability to deal with what is so often termed 'Big Data', analytics had arrived at a point in time when cloud resources could provide massive number crunching capabilities to deal with the ever increasing volumes of data travelling at ever-increasing velocities into data storage and from an ever increasing variety of sources.



Professor Robinson stated that we now lived in a time when it was no longer practical to simply take for example, 30 data points as O.R. practitioners might have done in the 1980s, and then apply central limit theorem and seek normality to solve all their problems. 'One of my worries is that many of us are still working in a world where we expect to get at most 30 data points and we hope that we might be able to see normality, but the world has an awful lot of data in it now and I think that has implications for how we practice modelling and O.R.'

Expanding upon this statement Professor Robinson presented a slide which depicted information taken from the International Data Corporation (IDC) and dated from 2011 as an illustration. This slide indicated that during 2011 we created 1.8 ZB of data, which is an awful lot.

The velocity and creation of this data was increasing by the minute, in fact more than 200 million email messages were generated around the world for every minute we lived. In that same amount of time over 2 million Google search queries took place and in that same amount of time 48 hours worth of new YouTube videos were uploaded and 684,000 bits of content were shared on Facebook and 100,000 tweets were created and published on Twitter – all in a minute! (*This information was correct as of the 2011 IDC report*)

THE ADVERTISING INDUSTRY NEEDS MATHS MEN AND MAD MEN

GRAHAM SHARP

In the latest edition of *Mobile Marketing* magazine, an article by David Murphy reports a discussion that took place at the recent ad:tech conference in London.



Don Draper (portrayed by Jon Hamm)

WPP is the world leader in communications services with projected revenues of \$19bn for 2014. It comprises leading companies in Advertising, Media Investment Management, Data Investment Management, PR, Branding & Identity, Direct Marketing, Digital, Promotion & Relationship Marketing.

At ad:tech, WPP chief, Sir Martin Sorrell, was discussing the changing advertising landscape and told delegates that media and data would make up \$9bn (£5.6bn) of WPP's projected \$19bn revenues,

with digital responsible for another \$6bn, leaving just \$4bn generated by the 'classic' advertising business. '\$15bn of the \$19bn is in areas that Don Draper wouldn't recognise,' Sorrell said.

Continuing with the Mad Men reference, he said advertising now was not just about 'the mad men and women, but also, the maths men and women'. He related the story of a recent pitch where the company was pitching to the CMO and the CTO and none of the other companies pitching for the business were the WPP company's traditional competitors, but tech companies.

Sorrell told delegates: 'Brand communications have to embrace the left brain and the right brain, the maths men and the mad men, the technical and the marketing, and I'm excited about that.' He conceded that the people WPP employs in 10 years' time will be much more analytical, technical and 'engineering-like', citing the example of Tesco's purchase of consumer insight company Dunnhumby. 'It's remarkable that Dunnhumby is part of Tesco,' he said. 'A retailer that understands the importance of data.'

Finally, Sorrell revealed the amount of money spent by WPP companies with Google, Facebook and others. He said that WPP was on track to spend \$3bn with Google this year, and confirmed that Google has displaced 21st Century Fox and News Corp as WPP's biggest media owner partner. He went on to confirm that WPP will spend \$650m with Facebook this year, compared to \$439m last, while Twitter will get \$100m of WPP clients' money, double what it got in 2013. To put things in context, Sorrell pointed out that the average spend with most big traditional media owners is \$1bn – \$1.5bn.

Don Draper is a fictional character and the protagonist of the television series Mad Men. Don was Creative Director of Manhattan advertising firm Sterling Cooper.

<OR>

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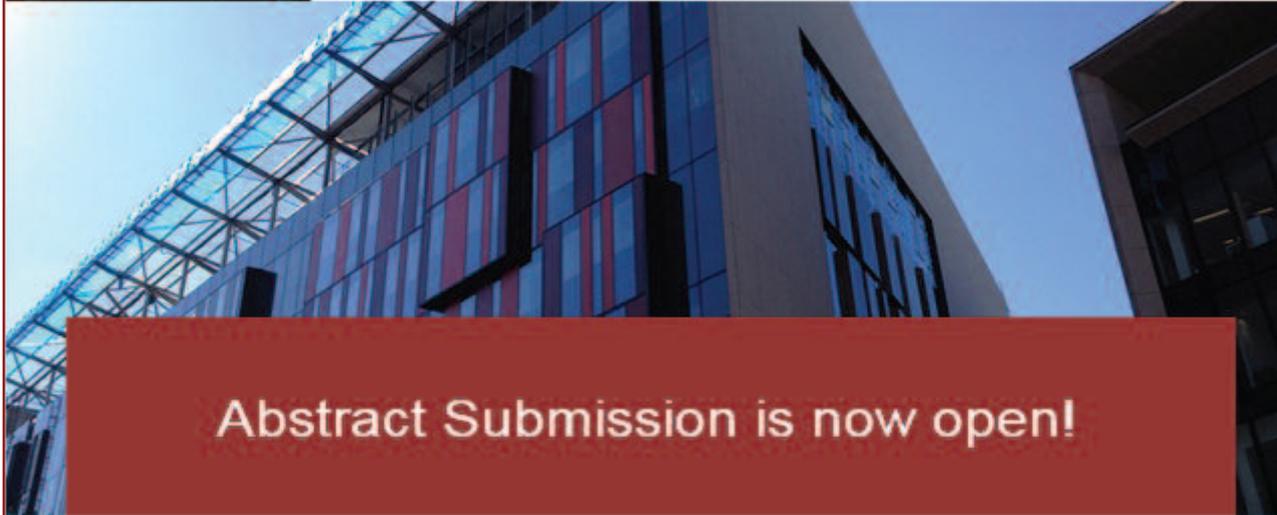
Help in getting started is here if needed:

www.theorsociety.com/Pages/Networking/FollowUs/GettingStarted.aspx



27th European Conference on Operational Research

12-15 July 2015
University of Strathclyde



Abstract Submission is now open!

We are delighted to announce that the abstract submission process for the 27th European Conference on Operational Research (EURO2015) is now open.

On behalf of The Association of European Operational Research Societies (EURO) and The OR Society, we invite you, as an important member of the OR Community, to join us in Glasgow between 12 -15 July 2015. For more information about this event, please take a look at our website on www.euro2015.org.

To submit an abstract and to register for our EURO2015 Conference, please click on the link above. Should you require any assistance, please contact the Conference Secretariat using the contact details below.

We look forward to welcoming you to our very exciting conference in Glasgow.

EURO2015 Conference Secretariat
c/o MCI UK Ltd
272 Bath Street
Glasgow
G2 4JR.

Tel: +44 (0) 141 354 1660
Twitter: [@EUROonline_News](https://twitter.com/EUROonline_News)
Email: euro2015@mci-group.com
Web: www.euro2015.org

Event Deadlines

Abstracts

Abstract Submission
OPEN

**Abstract Submission
Deadline**
Monday 16 March 2015

Registration

Registration and
Accommodation
Booking will be open
very soon.

Early Bird Deadline
Monday 20 April 2015

Registration Deadline
Friday 8 May 2015

YOUR NEW EDUCATION OFFICER

CHARLENE TIMEWELL, EDUCATION OFFICER

I am really excited to be joining the OR Society as the new Education Officer.



As a mature student with a young family, I recently graduated with a degree in Psychology and obtained Graduate Chartership (GBC) from the British Psychological Society after receiving their Undergraduate Award for attaining the highest first class honours of my cohort.

I tailored my studies to develop my understanding of the education system, special educational needs, reasoning, and decision making before focussing my dissertational research on the exploration of mathematics performance, self-efficacy, and confidence in five to eleven year old children across term-time and school holidays. Within this project, I also devised an intervention pack to stem learning loss by attempting to tap into the fun, 'real life' applications of mathematics.

Being strongly driven to support and inspire others to reach their potential, I have previously worked in education as a volunteer for a number of years, both in the classroom and behind the scenes on committees alongside roles in retail and administration.

Before joining the team here, I knew very little about O.R. and, although some techniques cross over into the field of psychology, it is not a term I encountered. I'm really enjoying drawing upon an array of different skills from my background in order to continue the great work that Louise and the O.R. in Schools Taskforce has been doing to bring O.R. into schools.

I will be continuing to promote careers and improve awareness of O.R. by increasing the number of visits to schools, colleges and universities, and increasing our presence at careers events. I am looking to forge connections with the newly established Math Hubs across the country and am already involved in the curriculum reforms and development of new qualifications. I will be increasing the 'O.R. in Schools' presence on social media platforms to increase transparency and allow members and the general public to follow my progress.

By the time you read this I will have met the O.R. employers and postgraduate course providers attending the OR Society's Annual Careers Open Day and I'm also updating and expanding our database of institutions and volunteers. I will be contacting members who have previously volunteered or shown an interest in volunteering their time so please do get in touch by dropping me an email at: charlene.timewell@theorsociety.com. If you have changed your contact details or haven't been involved before and would like to know more please also get in touch.

The LearnAboutOR website is also undergoing a facelift, so watch this space, as it should be more user-friendly and packed with new and improved resources and materials.



@ORinSchools



REGIONAL SOCIETIES

Contact details for all regional societies and meetings past and present are listed at:

<http://www.theorsociety.com/Pages/Regional/RegionalList.aspx>

NEW BENEFIT FOR MEMBERS – WEBINAR SERIES

LOUISE ALLISON, STRATEGIC PROJECTS MANAGER

Offering the Society's members an alternative to face-to-face meetings is one way to allow more people to take part in learning and information sharing activities.

Stewart Robinson gallantly led the way by delivering the inaugural webinar in what we hope will be a series of webinars given by members of the O.R. community.

With Stewart's background in simulation, he chose to present a novel approach to using simulation and lean together. Both approaches have a similar motivation: improvement of processes and service delivery, however, they are rarely used together. Stewart discussed the complementary roles of simulation and lean and demonstrated them in use with case examples. In presenting the use of simulation as a facilitation tool, Stewart highlighted that simulation models don't always have to be complex, accurate representations of a process in order to stimulate discussion and identify new ways of working. In the examples presented, a more abstract model allowed those involved to identify flaws in the system without having to spend weeks building a model and gathering data.

A recording of Stewart's webinar is available on the website, www.theorsociety.com/webinars

If you think you might like to share an idea or give a presentation using a webinar, but are not sure what it'd be like, here's what Stewart had to say: 'this was my first experience of running a webinar. I am very used to speaking to a live audience that is physically present, but not to one that is somewhere else in cyberspace. Although it took a little adjustment in style of delivery, it was relatively straightforward to set-up and run the webinar. It was certainly useful to have had a practice run with a volunteer audience beforehand.'

Stewart also added, 'I found the text chat feedback and the ability of the audience to come onto the microphone and ask questions very useful and easy to manage. It was certainly a great benefit that people did not have to travel to hear the talk. We even had one attendee from the west coast of Canada – I assume he was munching on his cornflakes at the time!'

Please let me know if there are any topics you'd like to see discussed via webinar or if you fancy giving one a go, louise.allison@theorsociety.com

<OR>

SPECIAL INTEREST GROUPS

ANALYTICS NETWORK

CONTACT Sayara Beg

EMAIL: ANChair@theorsociety.com

Christmas Networking

Date/Time: Thursday, 04 December 2014 18.00 - 22.00

Venue: TBC

To meet fellow Data Scientists, exchange ideas, share experiences and knowledge, with some festive nibbles and drinks.

Seeking a sponsor to host this event.

Sign up here to come along:

<http://www.meetup.com/AnalyticsNetwork/Register> at -

<http://www.eventbrite.com/e/lunch-learn-case-study-improving-patient-care-with-predictive-analytics-tickets-12855492123>

BEHAVIOURAL OR

CONTACT: Sally Brailsford **EMAIL:** s.c.brailsford@soton.ac.uk

CONTACT: Dave Buxton **EMAIL:** dave@dseconsulting.co.uk

CONTACT: Phil Jones **EMAIL:** philandjojones@hotmail.com

Developing Behavioural Operational Research in a Health Context

Date/Time: Wednesday, 17 December 2014 at 10:30 - 16:00

Venue: 102A. Skipton House, Elephant and Castle, London SE1 0BT

Speaker: Geoff Royston, David Lane, Konstantinos Katsikopoulos, Dave Buxton, Sally Brailsford

An excellent set of speakers:

- Geoff Royston, former president of the OR Society
- David Lane, winner of the OR Society Presidents Medal 2014
- Konstantinos Katsikopoulos, Max Planck Institute, Berlin
- Dave Buxton, Decision Labs (SIG co-chair)
- Sally Brailsford, University of Southampton (SIG co-chair)

Hosted by Tony O'Connor - Chair of Government Operational Research Service

Your chance to explore and inform the development of a new theme in O.R. and to hear how behavioural techniques are influencing modelling and delivery of health care systems

All welcome. What will nudge you to come?

Spaces are limited so to reserve a place please email Claire Ginn at claire.ginn@dh.gsi.gov.uk

COMMUNITY OR NETWORK

CONTACT Huw Evans

EMAIL: huwdevans@gmail.com

Community OR Special Interest Group - Annual General Meeting

Date/Time: 11:30 (GMT) Thursday 27 November 2014 at 11:30

Venue: Operational Research Society Offices, Birmingham

Proposed Agenda:

- 1 Welcome, introductions and apologies
- 2 Agree Chair for the meeting
- 3 Select officers of the committee
Proposer and Seconder for each post
Amend ToR as necessary and formally adopt them
- 4 Outline priorities for the following 1 – 2 years
- 5 AOB

The AGM will be followed by an ordinary meeting of the COR SIG.

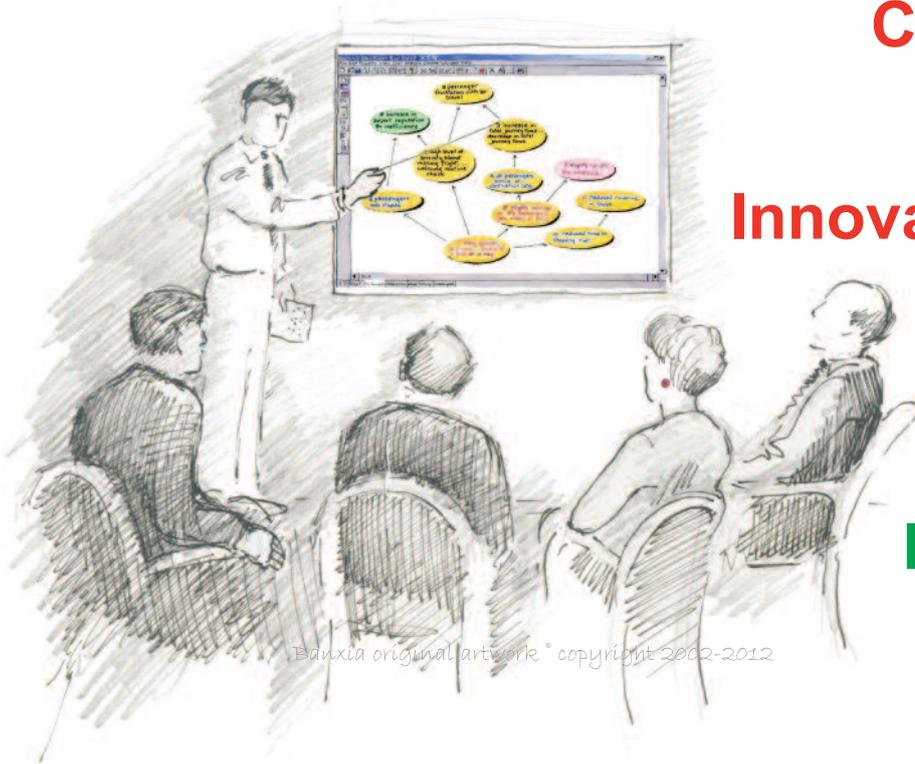
For those attending, in person or online, I'd be grateful if you could email Huw Evans (huwdevans@gmail.com) so that your participation can be enabled/facilitated.

<OR>

Creative thinker?

Innovative individual?

Problem solver?



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We offer a variety of well established, easy to use, decision support tools.

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- **Connect™** - allows a group of people in the same location to collaborate in the entry of ideas around a topic, and then to organise them by preferencing, rating or otherwise evaluating them. Designed to support Visual Strategy Making alongside our Decision Explorer software, it is free to try it out, and supports up to 32 participants using tablets or laptops with any modern browser. Decision Explorer Connect starts at £99 + VAT for 8 participants.
- **Decision Explorer®** - an ideas mapping tool used to organise and structure an individual's or a group's ideas about a problem or issue. This is a piece of software with many uses, in areas such as strategic management, risk assessment, project planning/ definition and general problem structuring. Single user licenses start from £99 + VAT.

“Decision Explorer® has proven to be a powerful facilitative tool. Used ‘live’ in workshops it provides a very efficient and productive means of keeping participants focussed and communicating. As a means of joint decision making, I have not found better.” Kenny Forsyth, Consultant

- **Frontier Analyst® Professional** - a performance measurement tool, using Data Envelopment Analysis (DEA), to give a relative assessment of the performance of a group of business units. Used in organisations that have a network of branches/ depots or in situations where a group of similar “units” can be identified (for example, hospital wards, banks, shops, teams within a company and so on). Single user (75-unit analysis capability) licenses start from £195 + VAT.

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NEWS OF MEMBERS

The Society welcomes the following new members,

PAOLO ALCINI, London; MICHAEL BENBORHOUM, USA; JERZY GURYCZ, Bedfordshire; AMBER LYDIATE, Kent; LOUISE JOHNSON, Bury; MARK WANZALA-RYAN, London; EMMA WOODHAM, Bristol; MARK WANZALA-RYAN, London;

and Reinstated members,

PAUL EDKINS, London; DAVID FITZGERALD, West Yorkshire; PRABHAKAR NAGARATNAM, India;

and the following student members,

OWOYEMI ABDULWAHAB, University of Edinburgh; JAMES ADAMSON, University of Southampton; OLAOLUWA ADEDIRAN, University of Westminster; KRITI AGGARWAL, University of Aggarwal; CHARLES AGUNBIADE, University of Coventry; ABDELLATIF AIT BOUMHAOUT, University London (School of Economics); ABIDEMI AKANDE, University of Southampton; ILIAS ALEXIOU, Lancaster University; SALMAN ALHARRETHI, Brunel University; GHAZWAN ALSOUFI, University of Essex; HARRIET-ROSE AMERY, University of Cardiff; AUDREY AUBIN, Cranfield University; CHARLES BARR, University Cardiff; ELIAS BENABBAS, Cardiff University; ANNA BODEY, University Cardiff; CANSU BOGAZKAYA, University Greenwich; JAKUB BOJARA, University of Southampton; PETER BONNINGTON, University of Bristol; NACHADEE BOONCHIT, University Lancaster Management School; ORESTIS BOTSARIS, Manchester Business School; CHARLIE BOUCHERIE, Lancaster University; PANAGIOTIS VASILEIOS BOUGIOUKOS, University of Southampton; ASH BULLEMENT, Cardiff University; HOLLY BUTCHER, Cardiff University; CEYHAN CEYLAN, University of Aston; PORNPIMOL CHAIWUTTISAK, University of Southampton; EMMA CHAMBERS, University of Southampton; WANNISA CHATAMORNWONG, Lancaster University; EMMANOUIL CHATZITHANASIS, University of Lancaster; RHIANNA CHELL, University Cardiff; BINHUI CHEN, University of Nottingham; GURDEEP CHIMA, Aston University; ARITAD CHOICHARON, University of Leeds; MAN HIN CHUN, University of Bristol; POPPY CLAPINSON, University of Liverpool; ZOEY CLOUGH, Lancaster University; RICHARD CRAIG, University of Bristol; HAKAN DAGLI, University of Kent; WAQAS DASTAGIR, University of Kent; EMILY DAVIES, Cardiff University; RHIAN DAVIES, Lancaster University; CHARLES DAY, University of the West of England (UWE); DANIELLE DELELLIS, University of Westminster; SCARLETT DEMPSEY, University of Greenwich; JULIUS DESELAERS, Lancaster University; MUHAMMET DEVECI, Yildiz Technical University; WEIRAN DING, University of Southampton; ANGUS DOHERTY, University of Greenwich; ONYESEINBO DOKUBO, Cranfield University; BO DONG, University of Southampton; ADELINO GUILHERME DOS SANTOS, University of Lancaster Management School; STAVROS DRIVAS, University of Southampton; SHAUN EDWARDS, Cardiff University; KAYLEIGH ELLIS, University of Edinburgh; JACQUELINE ENGDAL,

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THE VOICE OF O.R.

JOHN HOPES



‘One category of issue on which the OR Society has indeed expressed opinions in the past is the type of issue that directly affects O.R. itself such as the importance and shape of mathematics teaching in schools.’

Part of the OR Society’s mission statement is that the Society ‘effectively promotes the use of O.R.’; and this is something we do extensively through our publications, our events, our training, our O.R. in schools initiative, our web sites and elsewhere.

But despite this activity we do seem to suffer from low public profile by comparison with some other professions. For example, I struggle to remember the last time I came across the phrase, ‘a leading Operational Research Analyst was quoted as saying...’, whether in a newspaper or on broadcast media. But raising the media profile of O.R. is not an easy task. And first we need to be clear about the issues on which we would expect an O.R. spokesperson to be consulted. That is, we would need O.R. to have a point of view about something.

One category of issue on which the OR Society has indeed expressed opinions in the past is the type of issue that directly affects O.R. itself such as the importance and shape of mathematics teaching in schools. This kind of issue does give us the opportunity to make the case that mathematics teaching is important to O.R. and that O.R. is in turn important to the economy and Society. A similar case can and should be made for Government support for O.R. MScs, particularly given the increasing skills gap and the potential impact that will have on international competitiveness. We should definitely keep expressing points of view on this type of issue and using them to explain in addition the importance of O.R. But what about general issues where an O.R. perspective is required? What news story would require a quote from an O.R. professional? Economists find it all too easy to be consulted by the media on a wide range of issues relating to the economy, regardless of the fact that so few of them foresaw the last financial and economic crisis. But what is the equivalent for O.R.?

There are, of course, important issues where those of us on the inside of O.R. know that an O.R. professional could add great insight to a story. For example, on anything to do with queuing, whether relating to hospital waiting times, transport delays or the infamous teething problems at Heathrow Terminal 5. The problem here is educating those in the media to know that they need an O.R. expert when such a story crops up. And this will take time and effort.

But what about turning this around and considering the big megatrend type of issues that are being widely discussed and determining whether there is a distinctive O.R. angle to any of them? One, for example, where I think we should have a point of view is that of productivity. In fact, in my opinion, this is an issue where Economics can ask the question but only O.R. can provide an answer. And it is an issue that has come to the fore following the economic downturn. Both Government and Industry are currently grappling with the dilemma of how to increase the productivity of

both the economy as a whole and of individual enterprises. The beauty of O.R. is that it not only demonstrates where there is a productivity enhancement opportunity, it also shows management how to achieve that improvement.

Other examples of potential major issue O.R. points of view could include: the extent to which policies or strategies fail because they fail to take account of feedback effects; or how poor (or non-existent) quantification of risk leads to over-optimistic plans, failures and value erosion. In addition, many tough management issues concern optimisation, which is certainly a topic where O.R. has an opinion. For example, how do I optimise my: capital structure, dividend policy, brand portfolio, trade-off between customer service and cost, allocation of spend to marketing or training activities? And O.R. can also provide insights on poor decision making, such as erroneous assumptions of linearity, an inability to handle probability or a failure to consider key areas of complexity. Having something to say about such issues could provide us with a way to start to engage more effectively with the media. And in my experience, the media are always looking for specific stories and interesting numbers, content that O.R. is well-placed to provide, through case study examples and quantification of the improvements that can be achieved by using the right approach.

And, on top of these, one of the biggest megatrends where O.R. definitely comes into play is that of emerging technology, including

the world of digital communications and Big Data. I was feeling pretty good about myself in having got this far through an article without mentioning the A word. But analytics is still attracting media attention, and O.R. does I am sure have a point of view on, for example, how increasing use of continuous digital monitoring can lead to increasingly real time optimisation of processes or, to tie this back to a previous point, how increasing data availability can drive productivity or other talent metrics such as retention, motivation or engagement. Unfortunately, this is an area where the RSS has recently stolen a march on us with their data manifesto. But Big Data is a big topic and there is plenty of space within it for O.R. to occupy. For example, instead of focusing on the data we could make our subject the effective use of that data to provide insight through modelling and analysis. There is a growing tendency among software vendors to want to put advanced analytical tools in the hands of everyone, despite the fact that not all have the skills to use such tools safely. What is the right balance between wider education and the use of specialists? And what are the dangers of getting this wrong?

As you have probably guessed by now, it is definitely my point of view that O.R. needs to have a point of view. But it would be good to hear the views of others. And is there one particular issue we should major on (as with the RSS and their data manifesto) where we could raise a distinctive voice above the general media babble?

<OR>

YOUNGOR19 – GREAT WAYS TO GET INVOLVED

Conference Aston Meeting Suites (CAMS) at Aston University, Birmingham. B4 7ET
22-24 September 2015

VICKY FORMAN, CHAIR YOR19

Are you an operational researcher in the first 10 years of your career?



If the answer is 'yes' then the Young OR conference is for you.

Put the date in your diary and start thinking about what you would like to present, more details on plenary speakers, streams and booking will follow in the months to come.

The last conference ran streams on a variety of topics from analytics to defence to sustainability and many more in between. It isn't all about the work, there was a pub quiz and the gala dinner in the evenings, a great way to meet new people in a relaxed atmosphere.

Do you want to be involved in running the conference?

It's also a great way to network with new people from across different industries, have your say in the conference and a brilliant experience to put on your CV.

If you have an idea of stream you would like to organise please get in touch.

If you want to be involved but not quite sure doing what please get in touch.

Email Vicky Vicky.forman@llamasoft.com and Hilary Hilary.wilkes@theorsociety.com

<OR>

ROGER TILLEY (1941-2014)

Roger Paget Rayleigh Tilley, former head of O.R. at Inland Revenue and chair of the Government O.R. Service, died on 15 October at Saint Francis Hospice, Romford, Essex.

Roger was born on 1 July 1941. He won a full scholarship to Gonville and Caius College, Cambridge, and graduated in 1963 with a First Class Honours degree in Mechanical Sciences. In 1967 he completed an MSc in Operational Research and Management Studies at Imperial College, London where he became a lecturer for several years.

In 1973 he joined HM Customs and Excise (HMCE). Although the profession had been established in the Ministry of Defence since World War 2, operational research was very new in the Civil Service with only about 20 or so O.R. analysts across government departments.

In the 1970s, the United Kingdom's application to join what has become the European Union involved the introduction of VAT, applied to all but small traders who were exempt, to replace purchase tax which had been relevant to only retailers. The number of businesses that needed to be covered thus increased considerably, and for the first time tax return data were held on computers. A notable project started by Roger at HMCE was a statistical analysis of VAT irregularities. He and his team devised an increasingly sophisticated risk-based strategy for guiding the local office visits-to-businesses programme. Essentially, a combined, so called 'Pcred', measure was provided to identify traders who posed the most likely sources of error and fraud. This focused information increased the success of tax inspections and of the revenue raised, and encouraged future compliance. Not all local offices were convinced by this analysis to begin with - local knowledge counts for much among tax officials! However, the work was a great success and such analysis continues today. It must have brought several billion pounds to the exchequer over the years that would otherwise have gone unpaid. Roger Tilley later led the whole O.R. group, which also gave advice on measures to counter smuggling and irregularities by traders in tobacco and alcoholic drinks. Roger and his colleagues in the Government Operational Research Service (GORS) thus deserve credit for their contribution to combating the black economy in the UK.

Roger enjoyed smoking a pipe and looked particularly academic, impressing his staff and the (internal) clients. This impression was fully justified. Roger was meticulous in his work both in the analysis of data and writing up of results. His example and training, working alongside junior colleagues in the early days, ensued that the whole of his group took up these high standards. Roger was equally careful in consideration of his staff. It was thus a smart, relaxed academic environment in which to work, with a full bookshelf of textbooks, daily meeting times for discussion and an on-going dialogue on challenges such as how to quantify the black economy. The work on developing performance indicators, always distinguishing between efficiency and effectiveness indicators, for

example, took place well before KPIs came into common usage. It was pioneering work in its time.

In 1987, Roger moved to head the now larger O.R. group in Inland Revenue and occupied that position until he retired in 1996. Again, compliance was high on the agenda for O.R., as was the increasing use of IT and the opportunities that brought both in analytical power and the availability of information. Roger was also behind the move to plain English in all government communications, which is very much in line with his values of inclusiveness, honesty and transparency. In addition, performance measurement became important to government, and this brought more opportunity for O.R. to help managers define and quantify their performance goals and develop systems for maintaining them.

Roger played an active role in GORS, notably in developing skills lists associated with each grade, to ensure systematic training, and transparency in recruitment and promotion in the 1980s. He later took his turn as Head of GORS for several years.

The fact that the operational research profession has grown from 20 to 500 members of GORS owes much to people like Roger. If Roger and his colleagues had been less successful, maybe there would be no GORS. The mandarins in those early days included many sceptics who dismissed O.R. as 'modern management nonsense'. Roger often had to be very persuasive to get work commissioned and did so through wise advice based upon considered reasoning rather than personality.

We are grateful to many former colleagues in GORS for sharing their memories of Roger. Tony O'Connor, the current Chair of GORS, sums it up nicely: 'Roger was a great inspiration to a large number of GORS members both past and present. The Government O.R. profession owes a lot to him and his influence through the 70s, 80s and 90s.' Roger Tilley's care for those working under him always stood out and will be remembered. Roger had much to be proud of, but was unflinchingly modest.

Roger liked to travel, walk and especially to sail; taking his children out sailing at the weekend was a highlight of his week. He was for many years an usher at the Roman Catholic Cathedral Church in Brentwood. He was diagnosed with lung cancer in September, and died after a short illness. His funeral took place on 31 October. Sadly his wife Patsy died unexpectedly within 2 years of Roger retiring. He leaves two sons and a daughter-in-law, Steven, Francis and Naomi.

MAINTENANCE MUSINGS

LOUISE MAYNARD-ATEM

This month I'll be continuing the 'My First Project' series with a piece from John Ranyard and his early experiences at the Field Investigation Group (FIG), which was part of the National Coal Board (NCB). John's recollections give us an insight into a highly contentious energy industry and also illuminate the differences between learning about O.R. and the practicing of it in an industrial context.

Also, as I've included a Problem Page puzzle for you to tackle over your Christmas break, just to keep your brains ticking over during the festive period.

My First Project – John Ranyard

In early 1963 I accepted a job offer from the NCB's OR Group, then called the Field Investigation Group (FIG) and decided to start in July, as I had already spent almost 5 years at Leeds University, first on an engineering degree and then on a post graduate diploma in electronic computation. Before I joined, I was thrilled to read a full page article in The Observer entitled 'Lord Roben's Mine of Information' which was all about FIG and how it was about to double in size as a consequence of its success. I could not wait to start!

My first significant project was about the maintenance policy for underground power loader machines, which cut the coal from the seam, transferred it to conveyor belts and eventually up to the surface. These machines had replaced the manual hewing of coal with pick and shovel but were very expensive and had suffered from reliability problems. As a consequence they were withdrawn from the coal face for overhaul at predetermined intervals – a very expensive operation – rather than when the coal face was exhausted. As the reliability of the machines began to increase, senior engineering and production staff began to question whether this policy was best.

I joined a team investigating the maintenance policy for Trepanners, one of the main power loaders at the time, with 228 in operation at the end of 1961. A typical coal face is around 200 yards in length and the yardage cut by a Trepanner – the number of strips times the face length – was recorded weekly as it was regarded as a good measure of the workload on the machine. At around 60,000 yards the machine would usually be withdrawn for overhaul dependent on the colliery engineer's knowledge and experience; thus, in practice, some Trepanners might run for 100,000 yards, or even more before being withdrawn for overhaul, but in the majority of cases, a machine would be overhauled two or three times during

the 'life' of a typical face.

The team was tasked with looking for evidence that the machines were becoming less reliable the longer they were operating, since a breakdown would interrupt coal production and was very costly. We devised a simple test: the operating period for each machine was divided into 10k yard segments, 0 – 10k, 10 – 20k and so on up to 100k and for each segment we collected information on the breakdown incidents and repair costs. Of course the numbers of machines still operating as the yardage increased would decline, partly because of the 60k withdrawal policy but also because some coal faces would finish earlier than planned because of an unexpected geological fault and very few had operated beyond 100k yards. Whilst some faces provide harsher conditions than others, causing a greater strain on the machine, we believed that our sample was big enough for this to be balanced out, except for the low numbers of very high yardage machines.

We collected information on breakdowns from manual records stored in the colliery engineer's office and this provided my first lesson. These records were quite detailed and if we could not understand anything there was usually an engineer around to help. This contrasted with computer databases which came later, which were often less detailed and where the 'owner' of the database was often remote from the operation. (I would always advise students of the importance of identifying and speaking to this 'data owner' so as to understand the quality and reliability of the information being collected.) We classified the breakdown information according to cause, for example 'mechanical', such as a seized gearbox; 'geological', such as having to cut through a hard band of stone; or 'damage' such as a roof fall causing external parts of the machine to be broken. Our analysis showed that a high proportion of breakdowns were random i.e. caused by damage rather than wear and that there was no evidence of increasing breakdowns with increasing yardage.

We then collected cost information from central workshops where the machines were overhauled and this provided a second lesson to

REGIONAL SOCIETIES

LONDON & SOUTH EAST (LASE OR S)

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Christmas Quiz

Date/Time: Tuesday 9th December, 6.00pm (for 7pm start)

Venue: Upstairs bar of Ye Olde Watling

LASEORS popular annual quiz night is back please sign up early, for this year's festive event. All profits from the event will go to charity. Teams should comprise 3 - 6 people. As last year's winners will be able to tell you there will be lots of exciting prizes etc.

There is limited space, so entries will be accepted until capacity is reached. The entry fee is still £40 per team this will include a buffet. Please send cheques payable to LASEORS, the team name, a contact phone number, email and name along with the expected number in your team, before 30th November to ensure a place. Post to Sandra Weddell, Transport for London, 5G7, 5th Flr, Palestra, 197 Blackfriars Road, London, SE1H 8NJ

MIDLAND (MORS)

CONTACT: Jen East (Secretary)

EMAIL: MidlandsORSociety@live.co.uk

The use of OR in designing new supply chain network in Marks and Spencer

Date/Time: Thursday, 27 November 2014 at 18.00-20.00

Venue: TBA

Speakers: Victoria Forman, Marks and Spencers

Details to follow

Operational Research at NATS

Date/Time: Wednesday, 3 December 2014 at 18.00 - 19.00

Venue: Room G8, Main Building, Aston University, Aston Triangle, B4 7ET

Speakers: Simon Martin

Non-members welcome, no charge is made. After the talk, you are welcome to join us and the speaker for a meal. For further information please contact MidlandsORSociety@live.co.uk

Abstract

This presentation will provide a brief introduction to NATS and a high level tour through the work of the NATS Operational Analysis department, giving an insight into this fascinating industry.

We will then focus on the area of airport capacity, discussing the range of problems for which simulation modelling of airport airside operations has successfully been applied at NATS. These include determining the impact of taxiway closures, selecting the best options for airport development and maximising the capacity of existing and planned assets.

We will cover the simulation methods used and give examples of the range of results and outputs that can be generated. We will highlight the impact and benefits of NATS simulation projects that have been carried out at home and around the world.

The ooh – ahh of simulation - Tuesday, 21 October 2014 at 18.00-20.00

SOUTH WALES (SWORDS)

CONTACT: Dr Jonathan Thompson.

TEL: 029 2087 5524 Fax: 029 2087 4199

EMAIL: ThompsonJMI@cardiff.ac.uk

SWORDS Seminar and Quiz

Date/Time: Wednesday, 10 December 2014 @ 18.00

Speaker: Professor Steve Disney

Venue: School of Maths, Cardiff University

Professor Steve Disney will be giving a presentation to SWORDS on the 19th of December and this will be followed by a quiz and food. More details will follow later.

<OR>

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NIGEL CUMMINGS

One of the best ways to ensure that a college student graduates is to intervene when that student shows signs of struggling. Unfortunately all too often, the signs are missed until too late.



Now an open source academic 'early alert' system based on predictive analytics is being implemented by a growing number of colleges and universities across the US. The predictive model was developed at Marist College - a liberal arts institution in Poughkeepsie, N.Y. and funded by a grant from the Bill and Melinda Gates Foundation as part of the Open Academic Analytics Initiative (OAAI). The goal in developing this predictive tool was to develop a model that could be used across higher education to improve the capabilities of all schools to retain students and intervene appropriately. In use it collects and mines data from a number of sources, including student aptitude data, learning management system event-log data and digital gradebook data.

Once students are identified as 'at-risk', the appropriate instructors are notified and then strategies and resources for improving their performance can be applied. The modelling is effective due to its speed in identifying at-risk students. It is claimed to be able to determine, within an accuracy range of 75% to 79%, how well a student is going to perform in a specific course within two weeks of classes beginning.

For more: <https://net.educause.edu/ir/library/pdf/SE11302.pdf>

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EPSRC FELLOWSHIP OPPORTUNITIES IN O.R.

EPSRC

Engineering and Physical Sciences
Research Council

Earlier this year EPSRC designated 'Mathematical Aspects of Operational Research' as a priority area for its postdoctoral and early career fellowships. The following link gives further information (you need to scroll to the bottom of the page):

<http://www.epsrc.ac.uk/skills/fellows/mathematicalsciences/>

This is a huge opportunity for outstanding individuals toward the beginning of their careers and I very much hope that there will be some great applications coming in. Please bring this opportunity to the attention of anyone you know for whom it is suitable. Careful inspection of the scope of the other priority areas revealed by the link will reveal further opportunities for O.R. folk- most especially in

the priority area concerning connections between the mathematical sciences, computer science and ICT.

Fellowship applications can be sent in at any time. However to go through the entire review process in the current academic year, applicants should aim for a submission date no later than mid-February 2015.

Any questions can be directed to Hannah Maytum (EPSRC) or Kevin Glazebrook (Lancaster). Both of will be delighted to give all the support possible to prospective candidates.

<OR>

OR-30

John Crocker

In December 1984 Peter Amiry stood down as Editor of *JORS*. During his tenure, the first special-topic issue was published – its theme: ‘The Year of the Micro’. What made this issue doubly interesting was that it was also the first produced in the OR Society’s offices as camera-ready copy. President of the Society (George Mitchell) also suggested that the Journal should be ‘an organ of record for the Society as well as a medium of publication’. As a result, many conference papers and abstracts were published during the four years which probably would not have found their way into the archives otherwise.

Given this latter innovation, I thought I would share with you some snippets from the ‘Conference Chairman’s Report’ of OR26. The conference was held 4th to 7th September 1984 at the University of Lancaster. On the Tuesday evening, delegates were entertained with a classical piano and violin concert (arranged by Ron Adelson). There was also a balloon debate in which Joseph Wisenbaum (John Crookes) was ejected first followed by Sir Alexander Fleming (Barbara Baring) and Jean Paul Sartre (Ed Fiddy) leaving Samuel Johnson (John Hough) to float away as winner.

Wednesday’s dinner was held in Grange-over-Sands which also involved being bussed out to Bowness before a sail on Windermere to Lakeside. After dinner entertainment was given by the Lune Valley Jazz club with Conference entertainment organizer, the late Cliff Wilkinson on piano. Thursday’s tours were to Lancaster and

Heysham Nuclear Power Station. The after-dinner speaker was Pat Rivett. This was followed by L.P. Fatti being awarded the Goodeve Medal and A.W. Nimmo the President’s Medal before the evening closed with a folk concert given by the Houghton Weavers.

During the four days, there were also four plenary sessions: Gene Woolsey ‘How to take over your corporation for fun and profit in your spare time’; Cyril Smith M.B.E., M.P. on the lack of democracy in society; Shiv Gupta and Larry Richards on the impact of high technology on management and; Chris Bonnington on the successful ascent of Everest by the south-west route in 1975.

As had happened at the two previous conferences, there was also a ‘Metaconference’ provided by Robert Bittlestone of Mexapraxis Ltd (using hardware supplied by Micro APL Ltd). For the younger readers, this was the nearest thing we had in those days to ‘Twitter’.

And who was the Conference Chairman, well of course, none other than Graham Rand, the Editor in Chief of *Impact* the latest OR Society magazine to be launched early next year.

Amiry, Peter, (1984) Editorial, *JORS* 35.12, Pp 1045 (jors1984210a.pdf)

Rand, G.K., (1984) O.R.S. Annual Conference 1984 - Lancaster, *JORS* 35.12, Pp 1115-1168 (jors1984218a.pdf)

<OR>

OR-20

Re-engineering O.R.

Has O.R. got what it takes to make BPR work?

How can O.R. workers play a successful role in Business process Re-engineering (BPR) programmes? This was the question that more than 30 of us set out to tackle at this one day event. However, there was a more fundamental issue to be addressed first. What is BPR anyway (the latest load of old hype from an American management guru?), and do O.R. workers want to be involved in such projects?

Identifying core processes

Our working definition for the day was that BPR is ‘any project involving major organisational change in which the business processes are re-examined’. The first speaker, Richard Mapleston, described a BPR project undertaken at Shell, which identified the core processes of the business (these tend to cut across organisational functions), and altered those processes in order to improve the company’s performance against certain metrics (such as cost or quality).

Using SSM

He outlined a number of stages in a BPR programme, and suggested that O.R. skills could fit in to the first and second stages – using qualitative modelling and soft systems methods to help identify the core processes of a business (the T in Checkland’s CATWOE), and describing the processes involving using detailed flowcharts or more sophisticated methods such as IDEF (integrated definition) or RAD (Role Activity Diagrams).

Richard pointed out that many of the tasks in a BPR project would take O.R. workers away from ‘traditional’ O.R. roles (for example, he discussed the important role of project sponsor in tackling the ‘people issues’ and supporting change management). Our second speaker supported the view that BPR projects should be done by multi-disciplinary teams. Bob Scott of Hoskyns explained how their ORC (O.R. Consulting, staffed by many former members of British Coal’s O.R. Group) provide a member of the team on every Hoskyns BPR project.

Culinary metaphor

The day was entitled 'Recipes for successful Re-engineering' and Ashok Hedge of Europe stuck faithfully to the culinary metaphor by giving us some of his key ingredients. It is vital that senior management give a BPR project their personal credibility. Ashok reminded us that such projects happen within the context of the current anxieties of executive management (new markets for the firm, new organisational structures, etc.), and must therefore address these key concerns of the board, using them as 'hooks' on which to hang the project.

Ashok's presentation was less about reengineering processes than the first two talks, and more about reengineering the whole business. Continuing this theme, our final speaker described a project which addressed the whole vision and positioning of his firm. Andrew Miller of AMEC is using SODA and cognitive mapping via the COPE software, to redefine his organisation, from high level objectives, via the organisational structure, down to detailed job descriptions.

Dipping their toes

So, our four speakers had given us an arrangement of ideas about what BPR is, and how O.R. contributes to 'hard' and 'soft' aspects of BPR projects. In syndicate groups, we then debated two issues of interest to O.R. workers who are thinking of dipping their toes in the BPR water.

First, what skills are needed by analysts who wish to provide effective support to BPR teams? Certainly fact finding, analytical and project management skills, where O.R. workers are felt to be strong. However, we felt that communication, facilitation skills and general business awareness were also vital areas where O.R. workers are not always (or not always perceived to be) as strong. But aren't all of these skills central to any O.R. project?

Second we discussed the barriers that might stop O.R. groups from getting involved in BPR, and how these might be overcome. As well as the barriers implied above (ie lacking the necessary skills and business experience), we focussed on the position and role of the O.R. group in the firm, and its credibility to undertake such a project (how is the O.R. group perceived by the rest of the organisation?) These barriers are felt to be difficult to overcome. Perhaps O.R. groups should try working with the external consultancy firms who are the first port of call for many companies such as Shell when they want to know how to get started.

Some of us felt that there are also self-imposed barriers to involvement – do we have the desire and motivation? Some O.R. folk are certainly cynical about BPR, discussing it as 'nothing new' or 'common sense'. And others feel that they should stick to 'less risky' projects. But many of these issues raised apply to any O.R. Group trying to raise its organisational profile – in the BPR field or any other.

Using BPR to reposition O.R.

Plenty of scope, then, for further research and reflective practice by O.R. workers and academics into BPR. One of the first issues to be addressed could be the education of senior managers in the appropriate uses of BPR, and their O.R. groups. What about applying BPR in order to re-position O.R. groups in their organisations? Perhaps this is where we should cut our teeth on the application of BPR – or is the possibility of failure too frightening?

Maureen Meadows and Cath Kitchen

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Hampshire (GU)

For an informal discussion in total confidence on any of these positions or the market in general, please contact: Teresa Cheeseman, Kate Fuller or Mark Chapman. Alternatively visit our website to view our current vacancies.