MASHnet

TORCH
Teaching Operational Research for Commissioning in Health

The TORCH Project

Developing a Curriculum in Operational Research for Health Commissioning

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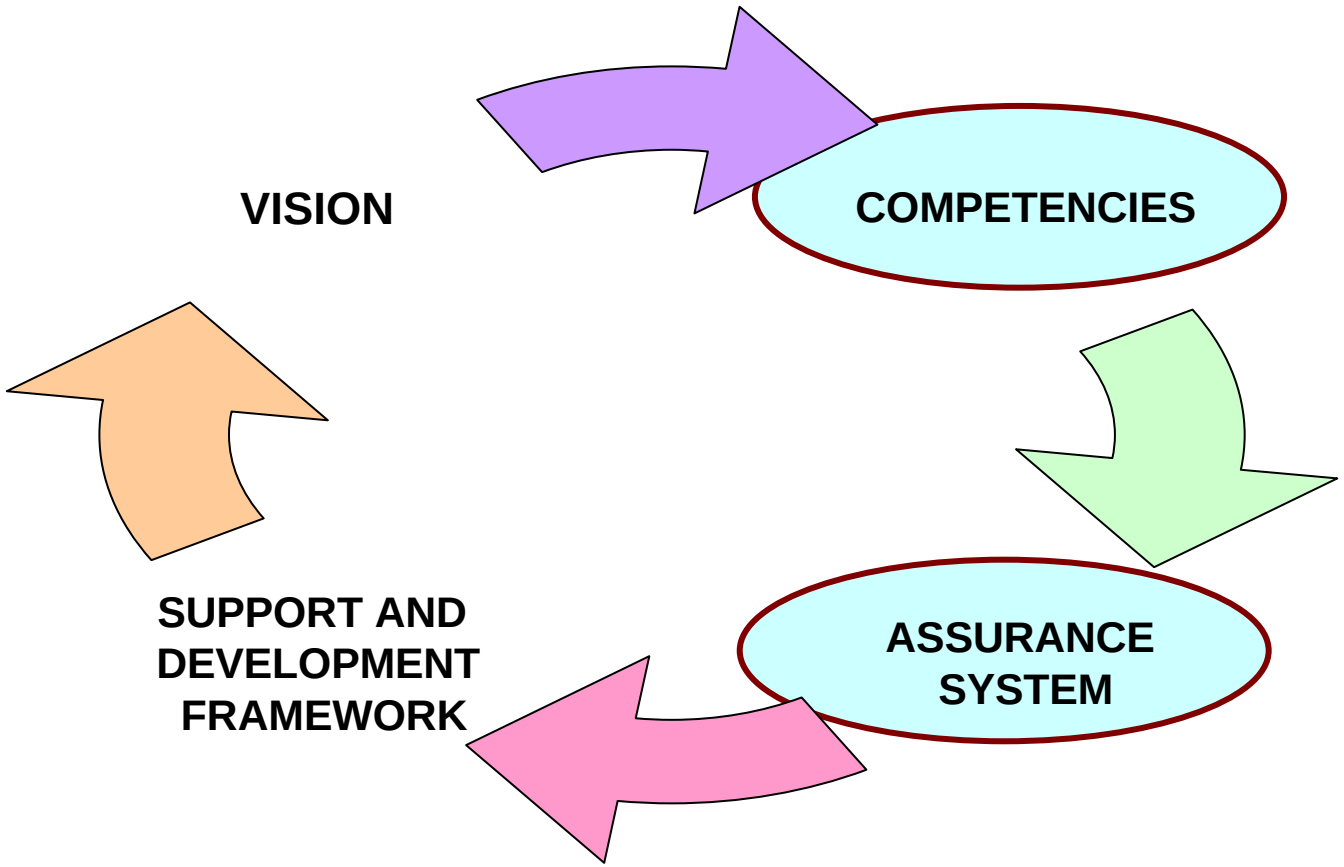
MASHnet/HSRN workshop : MODELLING AND SIMULATION IN A CHANGING NHS : 12 Nov 10

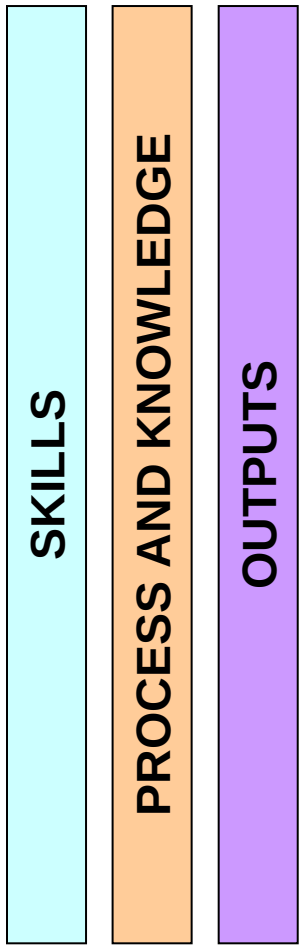
World Class Commissioning

Elements of WCC



WCC Competency Framework

- **1. Locally lead the NHS**
- **2. Work with community partners**
- **3. Engage with public and patients**
- **4. Collaborate with clinicians**
- **5. Manage knowledge and assess needs**
- **6. Prioritise investment**
- **7. Stimulate the market**
- **8. Promote improvement and innovation**
- **9. Secure procurement skills**
- **10. Manage the local health system**
- **11. Make sound financial investments**



Competency 5 :
Manage knowledge and assess needs
Skills Requirements

- Partnership liaison skills, to ensure a meaningful exchange of key data and analysis
- Information-gathering (of both quantitative and qualitative information) and research skills, including data quality assurance
- Database management and monitoring skills
- **Information analysis skills: predictive modelling; process mapping; ratio analysis; risk assessment; social modelling; scenario planning; needs analysis; statistical analysis; variance analysis**
- Presentation, negotiation, brokering and influencing skills

Competency 6 : Prioritise investment

Skills Requirements

- Database and knowledge management skills, using outputs from the JSNA to determine investment priorities
- **Prioritisation and decision-making skills: key input summary; predictive modelling; process mapping; ratio analysis; risk assessment; market segmentation; 'what if?' scenarios; simulation tools; spreadsheets; statistical analysis; variance analysis**
- Programme budgeting and marginal analysis capability linked to transparent investment decision-making processes
- Presentation and influencing skills

TORCH

Teaching Operational Research for Commissioning in Health

- Three months March – June 2009
- Commissioned by UK NHS Institute

Stated Objectives

- To scope the application of modelling and simulation techniques to strategic planning and commissioning within the English NHS.

- To identify the educational requirements of key groups of staff within Primary Care Trusts and other relevant organisations to enable them to become competent in the application of those techniques.

- To develop an outline curriculum for which a suite of educational materials can subsequently be procured and presented.

User Centred Approach

- Co-Design central to the development of the TORCH curriculum
- Interactive Workshops
  - Warwick University (7th April)
  - Westminster University (22nd April)
- Semi-structured interviews
  - Commissioners in PCTs
  - SHA
  - Other stakeholders

Workshops

1. Exploratory

Examination and definition of key issues

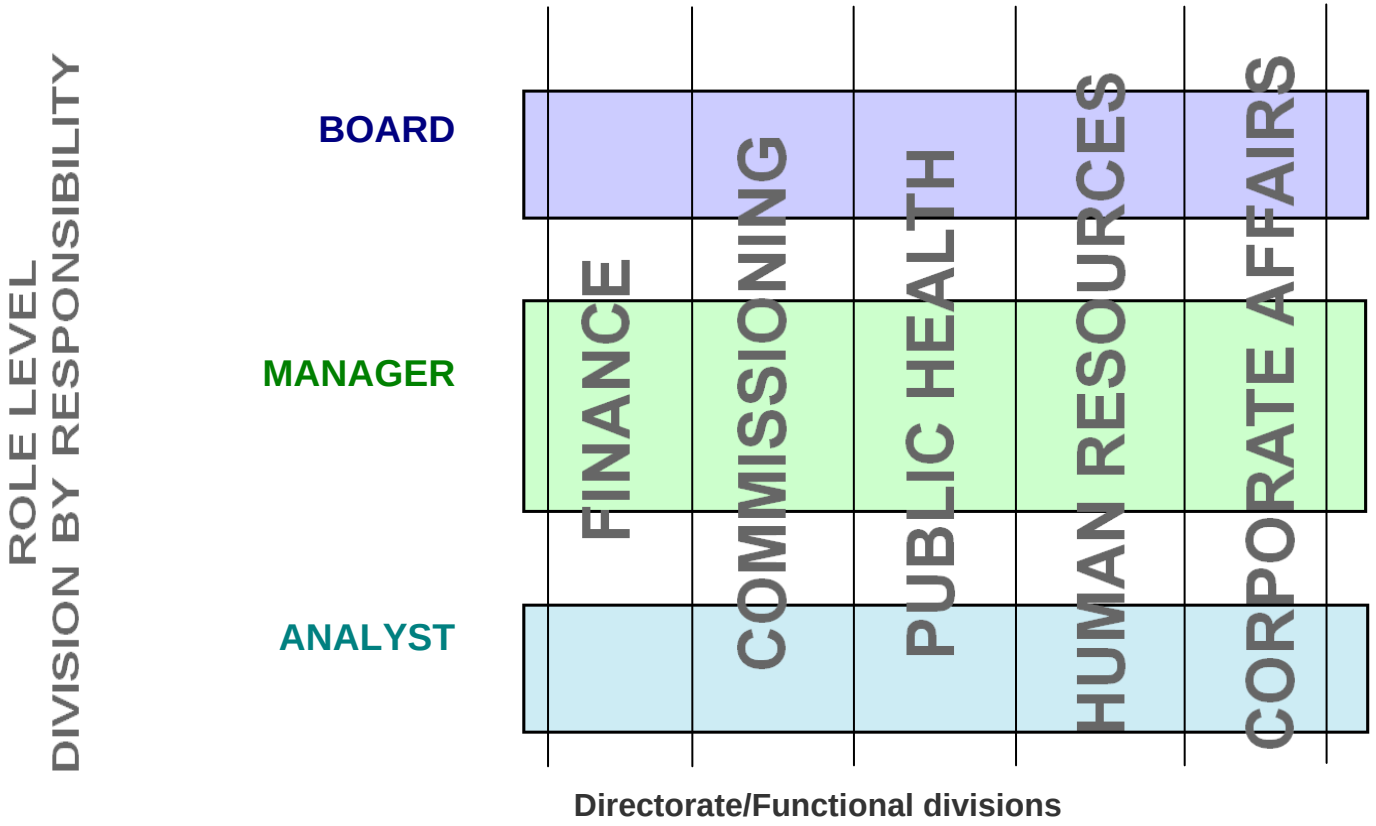
2. Evaluative/ Formative

Development and refinement of curriculum

Semi-structured Interviews

- 26 Semi structured Interviews
- Standardised template (40 minutes)
- 17 Face to Face / 9 Telephone
- Across range of different organisations
  - 11 PCTs, 2 SHAs, Commercial.
- Range of different roles
  - Senior Mgt, Middle Mgt, Technical levels
- Qualitative Analysis conducted on content

Define Key User Groups



Findings : Impact & Organisation

- **Dynamism** : PCTs very dynamic new demands and challenges
- **Diversity but similarity** : Although great variety amongst PCT the pressures of WCC creating some common responses (eg Matrix structures)
- **Integration** : Need to integrate separate aspects of organisation (joined up thinking) Public Health function in particular needs to be more integrated as well as links to other organisations (eg Councils).
- **Information Organisation** : Need to enhance Knowledge Management and Analytical Functions within PCTs etc.

Findings : – Activities and Methods

- **Formality** : Increasing need to formalise decision making and sharpen up act with commissioning.
- **Evidence Based** : Move to evidence based, quantitative methods
- **Proactively** : Need to move to a proactive basis rather reactive commissioning
- **Integration** : Need to integrate activities across departments
- **Skills Gaps** : Need to address skills gap for specific competencies

Findings : Skills & Competencies

- **Willingness to engage** : Commissioners keen to engage with TORCH
- **Useful framework** : WCC competency framework seen generally as a useful stimulus (wake-up call) for PCTs
- **Need for skills** : Recognised need for development (especially in analytic and modelling) but often starting from a low base. Often commissioners don't know what they don't know.
- **Diverse Roles** : Different levels of skills required at different levels (eg Board vs Information Analyst)
- **Knowledge levels** : Develop in-house expertise but also understanding to know when out-sourcing will be most effective route

Findings : Course Design and Delivery

- **Definite need** - for targeted course in health modelling linked to commissioning
- **Responsive** : Average PCT would be responsive (typically 20-30 employees would be suited)
- **Relevance** key aspect – use of case study material
- **Face to face** courses favoured – probably day or half-day release near or at place of work
- **Internet support** : seen as valuable for resource backup. Preparation and follow-up
- **Accreditation** seen as very useful
- **Structure** : Course should be coherent but modules would need to be stand-alone to enable ‘al al carte’ participation.

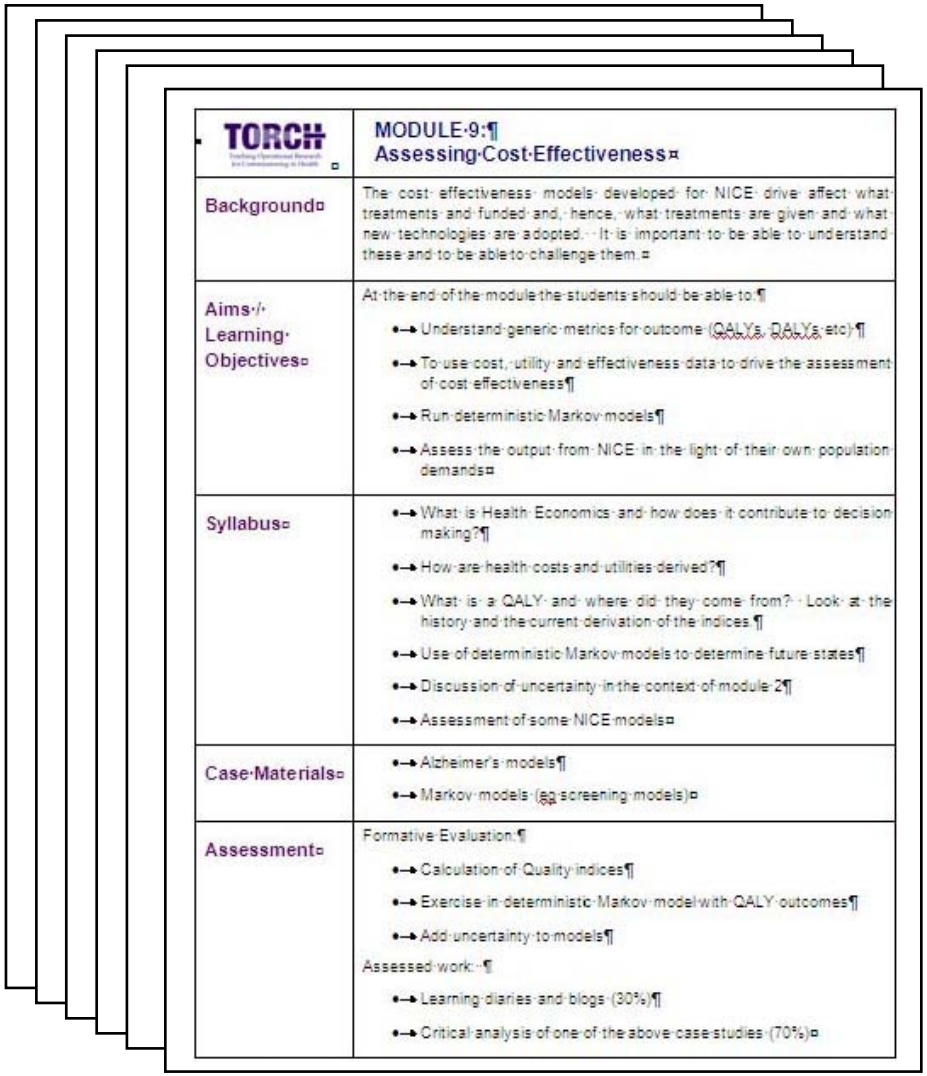
TORCH : Course Structure

- 10 - one day modules with flexible delivery (eg. half day splits)
- Allowance for selection of modules
- Use of internet and distance learning to support delivery of course
- Outline Structure
  - First half explanation, theory and application
  - Practical case work
- Accreditation via a range of methods

TORCH : Course Modules

1. Introduction : Modelling for Commissioning
2. Making Decisions
3. Structuring Problems
4. Understanding Data and Uncertainty
5. Forecasting
6. Service Redesign 1 (Mapping processes)
7. Service Redesign 2 (Using Simulation)
8. Whole Systems Modelling
9. Assessing Cost Effectiveness
10. Service Location and Geographical Models

Module Specification



TORCH	MODULE 9: Assessing Cost Effectiveness
Background	The cost effectiveness models developed for NICE drive affect what treatments and funded and, hence, what treatments are given and what new technologies are adopted. It is important to be able to understand these and to be able to challenge them.
Aims / Learning Objectives	At the end of the module the students should be able to • Understand generic metrics for outcome (QALYs, DALYs etc) • To use cost, utility and effectiveness data to drive the assessment of cost effectiveness • Run deterministic Markov models • Assess the output from NICE in the light of their own population demands
Syllabus	• What is Health Economics and how does it contribute to decision making? • How are health costs and utilities derived? • What is a QALY and where did they come from? Look at the history and the current derivation of the indices • Use of deterministic Markov models to determine future states • Discussion of uncertainty in the context of module 2 • Assessment of some NICE models
Case Materials	• Alzheimer's models • Markov models (eg screening models)
Assessment	Formative Evaluation • Calculation of Quality indices • Exercise in deterministic Markov model with QALY outcomes • Add uncertainty to models Assessed work: • Learning diaries and blogs (30%) • Critical analysis of one of the above case studies (70%)

- BACKGROUND
- AIMS & LEARNING OUTCOMES
- SYLLABUS
- CASE MATERIALS
- ASSESSMENT

1. Introduction : Modelling for Commissioning

- Introduction – outline of course
- Identify PCT problems
- Definition and examples of modelling
- Example use of modelling in Forecasting
- Building a simple model
- Good practice in spreadsheet modelling
- The use of spreadsheets in a responsible manner.

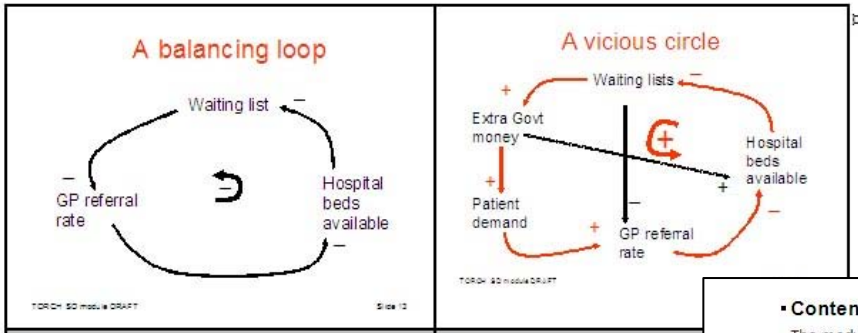
Module 5. Forecasting

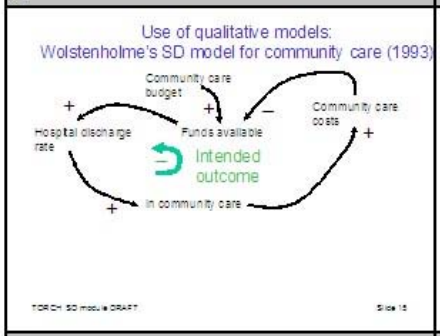
- **Introduction to concepts**, time series, seasonality, discontinuities, noise and residual variations,
- **Introduction to methods** for trend forecasting, outlining regression, moving averages, exponential smoothing etc.
- **Practical session** – Forecasting annual PCT birth numbers.
- **Practical session** – Forecasting age-specific birth rates.
- **Practical** – Incorporating commissioning decision and social factors into forecasts
- **Discussion** : uses of forecasting, reservations and challenges, links to planning and risk assessment.

8. Whole Systems Modelling

- **Introduction** and presentation of selected participant case studies.
- **Introduction to System Dynamics**
- **Case study** investigation : The Nottingham Project
- **Practical session** – mapping your own case study, developing influence diagrams
- **System dynamics in Compartmental models**. (eg agent based modelling)
- **Hands-on modelling** session using System Dynamic software.

Demonstration Content





▪ **Content¶**

The·module·content·will·be·built·around·an·exercise·to·forecast·the·number·of·obstetric·cases·to·be·catered·for·in·a·hypothetical·PCT·over·the·next·five·years.·¶

Session·1:·¶

- Introduction·to·time·series·concepts,·including·time·series,·trend,·seasonality,·discontinuities,·noise·and·residual·variations·will·be·introduced.¶
- Introduction·to·methods·for·trend·forecasting,·outlining·regression·and·moving·averages,·and·teaching·exponential·smoothing,·including·Holt's·method.·¶

Session·2·-·Practical¶

- Applying·exponential·smoothing·using·Excel·to·forecast·annual·numbers·of·births·in·PCT·over·next·5·years,·e.g.;·¶

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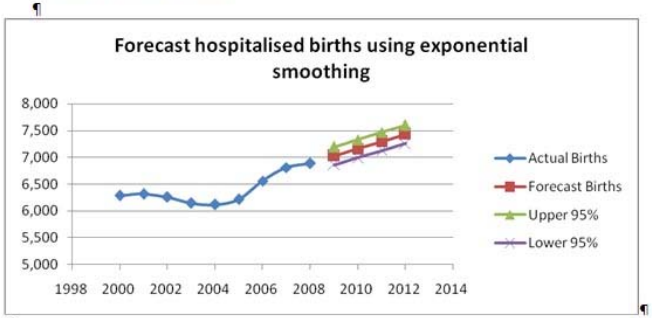

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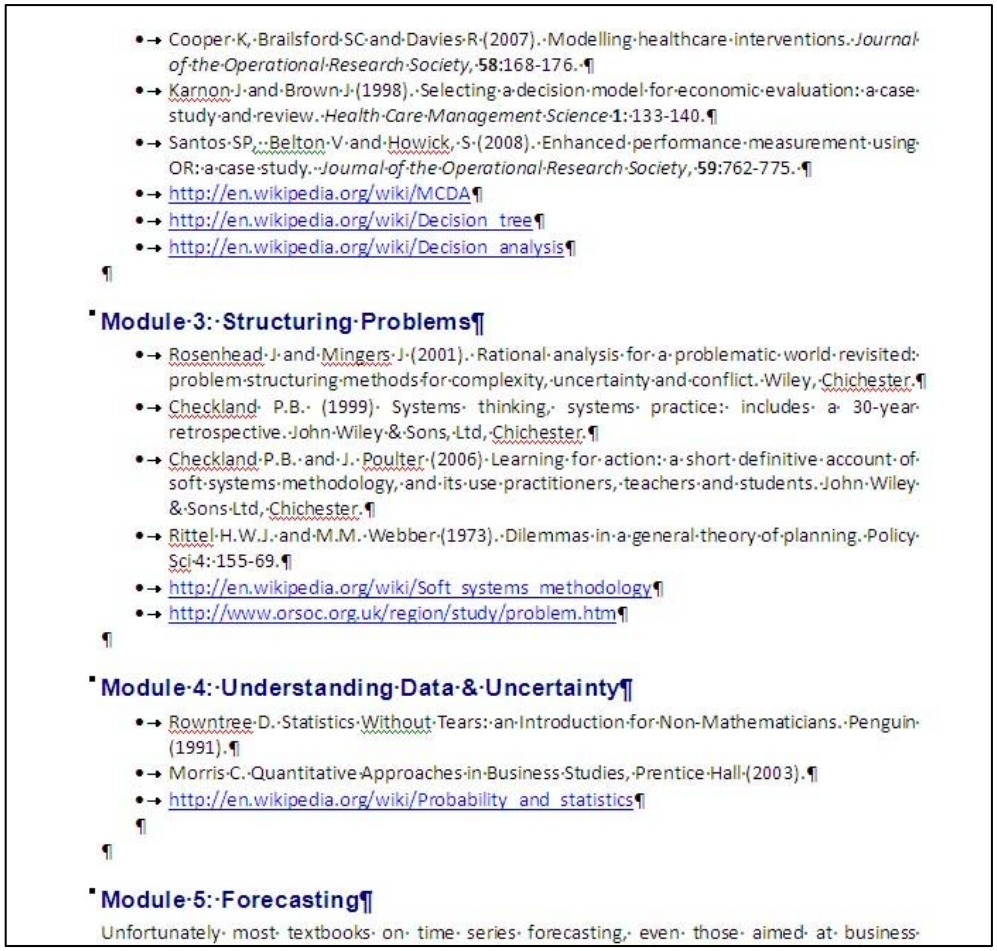
- Discussion·of·sources·of·inaccuracy·and·simple·methods·for·estimating·forecast·accuracy;¶

Structured Bibliography

- Relevant Books Papers, web sites
  - General to support course as a whole
  - Specific for each module of the course.



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- Karnon J and Brown J (1998). Selecting a decision model for economic evaluation: a case study and review. *Health Care Management Science* **1**:133-140.
- Santos SP, Belton V and Howick, S (2008). Enhanced performance measurement using OR: a case study. *Journal of the Operational Research Society*, **59**:762-775.
- http://en.wikipedia.org/wiki/MCDA
- http://en.wikipedia.org/wiki/Decision_tree
- http://en.wikipedia.org/wiki/Decision_analysis

Module 3: Structuring Problems

- Rosenhead J and Mingers J (2001). Rational analysis for a problematic world revisited: problem structuring methods for complexity, uncertainty and conflict. Wiley, Chichester.
- Checkland P.B. (1999) Systems thinking, systems practice: includes a 30-year retrospective. John Wiley & Sons, Ltd, Chichester.
- Checkland P.B. and J. Poulter (2006) Learning for action: a short definitive account of soft systems methodology, and its use practitioners, teachers and students. John Wiley & Sons Ltd, Chichester.
- Rittel H.W.J. and M.M. Webber (1973). Dilemmas in a general theory of planning. Policy Sci 4: 155-69.
- http://en.wikipedia.org/wiki/Soft_systems_methodology
- http://www.orsoc.org.uk/region/study/problem.htm

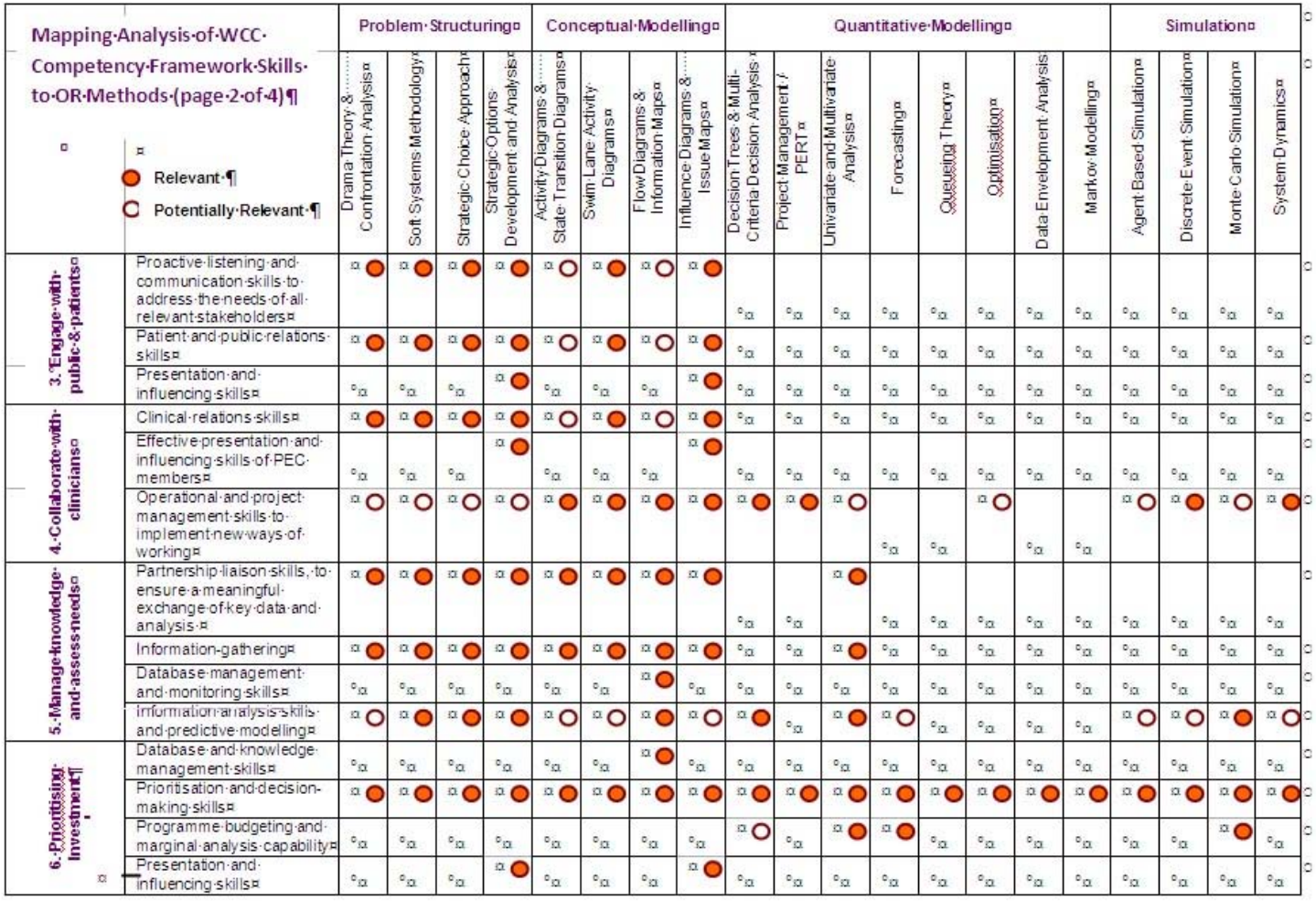
Module 4: Understanding Data & Uncertainty

- Rowntree D. Statistics Without Tears: an Introduction for Non-Mathematicians. Penguin (1991).
- Morris C. Quantitative Approaches in Business Studies, Prentice Hall (2003).
- http://en.wikipedia.org/wiki/Probability_and_statistics

Module 5: Forecasting

Unfortunately most textbooks on time series forecasting, even those aimed at business

Competency Mapping



Issues for Deployment for the TORCH Curriculum

- Market Analysis, Key users
- Competition
- Needs Summary
- Modes of Delivery and management
- Means of financing
- Organisation, administration, control
- Marketing and promotion
- Course Roll-out and maintenance

Next Steps ? *Plus ca change*

- TORCH course content is
  - generic : other functions (not just commissioning)
  - portable : other organisations (not just PCTs)
- Re-assess in light of current changes
  - Adaptable to new scenarios of use
- Content Development
  - Full content for selected modules
- Course Piloting

Thanks

Questions

Comments

Suggestions