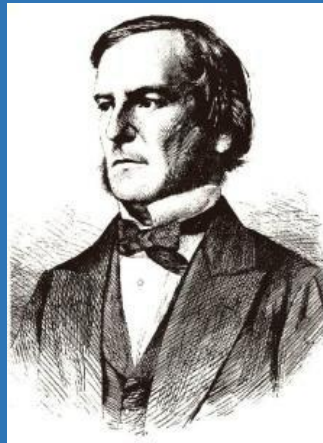


DAI

Decision Analysis Initiative 2010-2020

Interim Report



George Boole
1815-1864

In 1854, George Boole of Leicester in England, published the book *"The Laws of Thought"* that explained human deduction and decision-making. He described his mathematical logic, now known as Boolean logic, and a design technique, Boolean reduction. Today these are the foundation of some 99% of the world's software, design and operation of computers, logic circuits and communications systems, including the Internet.

The George Boole Foundation Limited

Commemorating George Boole's immense contribution to the world's ability to manage data, information, knowledge & deduction leading to better means of sustainable human wellbeing

March 2018

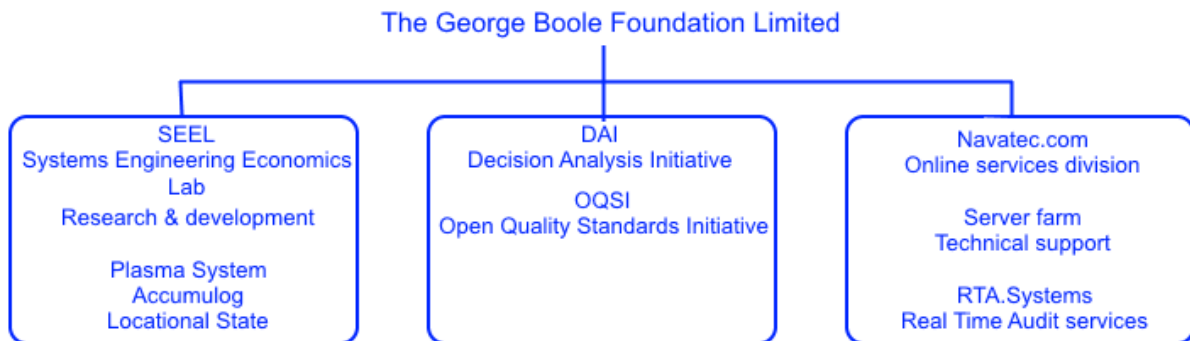
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THE GEORGE BOOLE FOUNDATION

The George Boole Foundation Limited is a not-for-profit company was established in 2010 to commemorate the immense contribution of George Boole to the world's ability to manage data, information and knowledge based on the mathematic logic devised by him and today known as Boolean Logic. The Foundation plans to establish a George Boole Institute to act as a centre of excellence in the development and promotion of advances in beneficial applications of Boolean logic.

The current operational units of the Foundation:



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INTRODUCTION

This is a summary Interim Report on the progress of the Decision Analysis Initiative launched by the George Boole Foundation in 2010. This is to provide information to interested parties on the scope of the activities within the DAI and the results achieved so far.

Hector McNeill
Director
The George Boole Foundation Limited
London

26th March, 2018

PHASE 1, 2010-2015

The George Boole Foundation Limited launched its first phase Decision Analysis Initiative (DAI) in 2010 to be completed by 2015.

This was based on small workshops, largely concerned with the dissemination of information of decision analysis and the potential contribution of digital logic devices in applying decision analysis to economic and agricultural development and innovation. An attempt was made to guide outcomes so as to produce results of relevance to high, medium and low income countries.

The outputs from the first phase of the DAI was hampered by lack of funding in the aftermath of the financial crisis that emerged in 2007/2008. However, a range of useful revelations and outputs were produced. The following represent identified issues or development which have been applied to good effect in the second phase:

- Failure rates of international lender and donor supported economic development projects are, in general, under-reported but represent almost 45% of funded projects
- Stakeholder involvement in whole project cycles is highly variable and often far lower than reported
- To reduce this rate of failure there is a need to invest more time and effort in decision analysis applied to the design activities of agricultural, economic development and innovation projects and policies to prevent avoidable costly mistakes during implementation
- Project design needs to be based on decision analysis models to improve the understanding of relevant factor interactions and to manage uncertainty
- Decision analysis models should be used to engage stakeholders effectively to improve model design and the quality of analysis, thereby improving the quality of projects entering portfolios
- Gaps and needs must be quantified as deficits in provisions or states of affairs and not as processes. Processes and solutions should only be identified on the basis of reviewing the state-of-the-art options available to address the specified gaps and needs in the most effective manner
- Preferably, projects should enter portfolios which have a global coverage, easy access and deploying per-project standardized datasets to enable objective comparisons
- Project oversight needs to cover the whole cycle (design, setup, implementation) and be real time and 24/7 providing access to all per-project information no matter where the projects are located
- Besides project management and teams, oversight facilities should be accessible by donors, investors, lenders and stakeholders

- Design operations need to be supported through the application of the most advanced and proven operations research methods to cover stochastic uncertainty models, change impact assessments as well as project impacts on results desired involving economic, finance, environment, ecosystems, energy & water economies and social issues

The Foundation published a paper by McNeill & Belko¹ that contained a review of the limitations of conventional project cycle management methods. Their main recommendations were the introduction of Tactical Option Maps (TOMs) and Real Time Audit (RTA). An additional paper on Data Reference Models was also published².

PHASE 2, 2015-2020

In reviewing the output of the first phase it was decided to establish the Open Quality Standards Initiative (OQSI) to bring all of the questions of project and policy procedural standards into a single operation during the second DAI phase 2015-2020. Further information on the OQSI [can be obtained on the dedicated website](#). The OQSI submitted a draft set of recommendations to DAI in 2016. These were structured around a due diligence project design procedure to support decision analysis by ensuring that all relevant factors were taken into account.

The evolving OQSI recommendation was used as a basis for the development of a cloud-based project cycle and portfolio system to introduce more effective analysis of uncertainty. Emphasis was placed on the identification and design of projects that fit within the boundaries of the constraints facing a project. The contributions of stakeholders are facilitated in project design through the provision of accessible model components that improve the communication between project managers, research teams and stakeholders.

An important objective of the systems design was to minimize the costs of entry and use of the system so as to assist clients and institutions in low income countries.

A considerable amount of the systems design was carried out at SEEL-Systems Engineering Economics Lab the George Boole Foundation's research unit in Portsmouth, UK. One of the changes introduced to the system was to substitute the McNeill-Belko TOMs (Tactical Option Maps) by LPOs (Logical Process Options) and to base tactical implementation decisions on Accumulog records held in a Plasma Database.

2015 - CHANGE IN THE FOUNDATION FUNDING MODEL

In the light of the difficulty in raising funds as donations in support of the Foundation, the Foundation consulted government, NGOs, agribusiness and institutional groups to identify an improved operational basis for raising funds.

The outcome of this consultation was a decision to abandon the practice of requesting donations and to switch to fund raising based on a service provision model. The service provision model was to be designed to bring quantifiable benefits to clients. The obvious candidate as a service provision was an improved project cycle and portfolio management system.

The Foundation therefore placed more emphasis on the design and implementation of a next generation, cloud-based project cycle and portfolio management system to be marketed on a fee-paying

¹ McNeill, H.W., and Belko, F, "*Towards more effective Project Management*", DAI, London, October, 2011, ISBN: 978-0-907833-02-4

² McNeill, H.W., "*Improving communications within systems groups*", Decision Analysis Initiative 2010-2015, Portsmouth, August, 2014

basis as software-as-a-service. The fundamental principle was to be able to demonstrate, on the basis of return on investment appraisals the benefits to any specific client.

As a non-profit foundation all income over and above operational costs would be returned to the Foundation in pursuit of its general objectives.

In mid-2016 Navatec.com, the services division of the George Boole Foundation, collaborated with SEEL in testing prototype modules and transforming these into a cloud-based software-as-a-service.

This service went live in January 2018 as a cloud-based software-as-a-service system.

[Navatec System has a dedicated website](#)

FEE-BASED MODEL WITH PERFORMANCE GUARANTEES

The current funding model applied to Navatec System is designed to minimize the costs of entry and maintenance for users, many of who will be from countries with low incomes and limited budgets.

The model to be applied is the software-as-a-service SAS Model. The steps in engagement with a client are as follows:

1. A free return on investment appraisal to determine customer objectives and needs
2. The preparation of a proposal for each specific customer containing:
 - the expected gains in terms of capacity for operations and costs
 - the expected savings
 - the expected gains in productivity
 - a fully costed proposal to the specific customer

This model provides any customer with full transparency as to the specific benefits to be gained in comparison with their current operations or as a new service.

The next phase is the demonstration of the service provision based on the proposed services.

As a result of the demonstration the potential customer can request modifications.

The provision of services is based on a low fixed monthly fee, paid in advance, the value of the fee is determined by the finally agreed service.

Pro-rata additional fees are charged according to the number of users of the system and the number of projects supported in a portfolio.

All technical support and upgrades are included in the fees.

The fee schedule will be posted regularly on the Navatec System website.

OTHER ACTIVITIES

During the course of the second phase we have developed several logical and software components that have a direct contribution to improving the effectiveness of computer-based decision analysis models for policy and projects. Some of these are deployed in Navatec System. These are described in the next sections:

PLASMA DATABASE

The Plasma database is a unique but powerful database structure that is controlled by indigenous server side JavaScript code as an extension of the ECMA and ISO standards. This provides a completely seamless operation with scripts handling user interfaces and controls and data-intensive processing. The Plasma Operating System is a very recent spin-off undergoing feasibility and utility appraisal.

The Plasma database is completely scalable and as a NoSQL operation to permit complete flexibility to handle the dynamic complexity of natural resources variability factors.

Plasma database is a key component in OQSI recommendations.

[Plasma database has a dedicated website.](#)

LOCATIONAL STATE METHOD

Locational State Theory is an object-oriented data structure designed to represent relevant determinants of object properties of particular benefit to natural resources and agricultural analysis. It helps augment explained variance and reduce unexplained variance contained in data sets without altering basic statistical designed in experiments or surveys. This corresponds to observations made by Ronald Fisher, the father of modern agricultural statistical analysis where he cautioned about the limitations of his own methods (Analysis of variance).

Locational state was identified during work on strategic requirements for learning systems at the ITTTF-Information Technologies and Telecommunications Task Force of the European Commission in Brussels in 1985 and was developed to establish a more precise data specification method to help improve the clarity of requests so as to improve the ability to monitor the coherence of data requested and data received over global networks.

The Locational State Method is a key component in OQSI recommendations

[Locational state has its own website.](#)

ACCUMULOGS

Accumulogs are blockchains that were identified during work on strategic requirements for learning systems at the ITTTF-Information Technologies and Telecommunications Task Force of the European Commission in Brussels in 1985. They were developed to establish an appropriate means of recording data, information and knowledge acquisition and to support reflective analysis and instant recall of detail for users. Currently the only application of Accumulogs has been the Seel-Telesis decision support system developed under a research grant from the Department of Employment of the government of the United Kingdom in 1990. The first commercial deployment is in the cloud-based Navatec System, a project cycle and portfolio management system.

Currently this approach to data recording and access is being evaluated by OQSI to assess whether or not to feature Accumulogs in OQSI recommendations. Assessment is based on Navatec System demonstrations.

[Accumulog has a card website.](#)

CONCLUDING

To date, all objectives within the DAI have been achieved successfully. We hope that this trend will continue through to 2020 when the final evaluation of DAI will be carried out.