AGIUS, Harry Wayne (1997)

A full-scale semantic content-based model for interactive multimedia information systems

Issues of syntax have dominated research in multimedia information systems (MMISs), with video developing as a technology of images and audio as one of signals. But when we use video and audio, we do so for their content. This is a semantic issue. Current research in multimedia on semantic content-based models has adopted a structure-oriented approach, where video and audio content is described on a frame-by-frame or segment-by-segment basis (where a segment is an arbitrary set of contiguous frames). This approach has failed to cater for semantic aspects, and thus has not been fully effective when used within an MMIS. The research undertaken for this thesis reveals seven semantic aspects of video and audio: (1) explicit media structure; (2) objects; (3) spatial relationships between objects; (4) events and actions involving objects; (5) temporal relationships between events and actions; (6) integration of syntactic and semantic information; and (7) direct user-media interaction.

This thesis develops a full-scale semantic content-based model that caters for the above seven semantic aspects of video and audio. To achieve this, it uses an entities of interest approach, instead of a structure-oriented one, where the MMIS integrates relevant semantic content-based information about video and audio with information about the entities of interest to the system, e.g. mountains, vehicles, employees. A method for developing an interactive MMIS that encompasses the model is also described. Both the method and the model are used in the development of ARISTOTLE, an interactive instructional MMIS for teaching young children about zoology, in order to demonstrate their operation.

Supervisor: Prof M Angelides

AL SUDAIRI, Turki (1994)

Information Systems in Saudi Arabia

The Kingdom of Saudi Arabia is a relative newcomer to information systems, largely as the result of the large scale development projects in the 1970s and 1980s. This development has had enormous impact on the social, political, economic and scientific realities of the Kingdom However, the lack of planning in this sector has caused large scale inefficiency, misdirection and waste. It is generally accepted that the time has come to adopt an information systems strategy in order to utilize past successes within a new direction that fits the social, political, economic and cultural aspects of the country. This thesis proposes such a strategy and justifies its conclusions with a six stage analysis. The first stage identifies several theories relating to the area of IS that are crucial to the development of strategy, and that provide an entry to the study of the national identity as a system. The other stages identify the conditions in Saudi Arabia, the experiences of other countries, and public and private sectoral conditions. The plan is presented in the form of evolutionary programmes that are to be adopted in a number of stages over the time scale of two successive five year plans, and finally its implications are discussed.

Supervisor: Prof I Angell

AL-TAITOON, Adel (2005)

Making Sense of Mobile ICT-Enabled Trading in Fast Moving Financial Markets as Volatility-Control Ambivalence: Case Study on the Organisation of Off-Premises Foreign Exchange at a Middle-East Bank

This research study is concerned with the organisation of mobile work. The change towards increased physical separation and the wide adoption of mobile technology are likely to entail fundamental changes to the organisation of work. The de-contextualisation and mobilisation of social activities magnifies the complexity of organising remote working. When the context of mobile interaction and ICT-enabled remote working is highly volatile environment which involves instantaneous decision making and spontaneous acts within institutionalised systems of control, then researchers are presented with added complexities that require careful analysis. Thus, embarking on theoretical endeavours to build an understanding of mobility and the organisation of mobile work in highly fluid and dynamic environments should not be underestimated.

This study explores how mobile ICT-enabled remote working is organised. Inspired by emerging theoretical developments on mobile interaction and motivated by the researcher’s self-interest in social, technological and economic issues concerning the financial market, the research aims to make sense of the distinct
mobility of foreign exchange traders. The use of mobile computing technologies in foreign exchange trading represents a mode of remote working in a highly dynamic and fluid environment. The study, specifically, examined the influence of market volatility and corporate control on the organisation of mobile ICT-enabled off-premises trading. To achieve this objective, I have undertaken empirical case study research at a large banking organisation in the Middle-East.

I have adopted Weick’s theory of ‘organising as sensemaking’ which offers a conceptual framework that consists of ecological change and three sensemaking processes (i.e. enactment, selection and retention) together with feedback loops. The findings of this study are, therefore, based on employing Weick’s framework as an analytical lens. Furthermore, drawing upon Weick’s conception of ambivalence and loose-coupling, I have argued that the existence of volatility-control sensemaking entails organising mobile foreign exchange as loosely-coupled mobility. The market volatility represents not only the fluctuation of exchange rates but also the equivocality that characterises the foreign exchange environment. To cope with such volatility, equivocality and uncertainty, financial institutions adopt systems of control that, in turn, influence the traders’ interaction. This ambivalence of volatility and control entails an optimal compromise. In this study, I have argued that this optimal compromise is achieved by adopting loosely-coupled organisation of mobile work to satisfy the simultaneous effects of volatility and control as two antithetical factors.

Supervisor: Dr C Sørensen

ALBADVI, Amir (1997)
Supporting Design Understanding in Evolutionary Prototyping: An Application of Change Theory and Semiotics

This thesis researches the problem of building design understanding in rapidly changing environments. Although evolutionary prototyping has been proposed before as a solution, little serious investigation has been undertaken into its practical and theoretical adequacy. This thesis assesses the evolutionary development approach and on the basis of the findings of an exploratory case study conducted in a large car manufacturer company, proposes a new perspective in this approach. It combines the planned organisational change theory and semiotics which respectively underpin implementation management and design understanding.

The cornerstone of the proposed perspective is a semantic analysis technique which complements evolutionary prototyping. The perspective builds on three cycles of planned change model: a vision cycle providing easy access to design knowledge, an action cycle supporting modular development of prototypes based on the semantics of design knowledge, and a fusion cycle institutionalising design understanding. An explanatory empirical study conducted in a management consultancy, provides a first step towards a subjective validation of the proposed approach.

A conceptual training process is suggested as a means of partnership between designer and user. This process provides a way for both user and designer to find a common designation for the terms they share in their communication, and to build a shared meaning and interpretation of actions in the workplace.

Supervisor: Dr J Backhouse

ANGELIDES, Marios (1992)
Developing the Didactic Operations for Intelligent Tutoring Systems: A Synthesis of Artificial Intelligence and Hypertext

This thesis investigates the architecture of an intelligent knowledge based tutoring system in terms of three knowledge models: that of the domain, the student and the tutor, and examines the interrelatedness and interconnectedness of these three knowledge models. Existing knowledge based tutoring systems are reviewed, and the relationship between their behaviour and architecture is analysed by evaluating them against Wenger's model of a didactic operation. Two such systems, PROUST, a tutoring system for Pascal program debugging skills, and micro-SEARCH, a tutoring system for mathematical transformations skills, are used in the study. This evaluation serves two purposes: to unravel the requirements for interrelatedness and interconnectedness between the three knowledge models in order to develop a true knowledge based tutoring system with a full-scale didactic operation, and to uncover the limitations of the current generation of knowledge based tutoring systems and how they fail to fully encompass these
requirements. On this basis the thesis goes on to propose a hybrid model made up of artificial intelligence and Hypertext concepts which helps to overcome the limitations of existing knowledge based tutoring systems. This model in particular addresses the requirements for the development of an intelligent tutoring systems with a full-scale didactic operation. The model integrates Hypertext's explicit information nodes and linking properties with artificial intelligence's logical inferencing on knowledge representation schemes. The thesis finally shows how to use this model to design a generic intelligent tutoring system that supports a full-scale didactic operation.

Supervisor: Prof R Paul

ARINZE, Orakwue Bay (1987)

Decision support systems (DSS) are computer-based systems for supporting qualitative or semi-structured managerial decision-making. This research has arisen primarily in response to challenges in the area of DSS methodology, aimed at guiding and enabling DSS users and practitioners alike to successfully design and build DSS. Decision support is viewed as representing the essentials of a distinctive approach to problem solving, the tools themselves being of a secondary concern. An important issue is the interface between the DSS and the user. The nature of information flows across this interface, particularly the forms of user enquiries, are central to the approach outlined in the thesis. The methodology and related models are proposed and used in a real-world case study, with supporting practical and theoretical evidence gathered.

Supervisor: Prof F Land

AU, Grace (1990)
A Graphics Driven Approach to Discrete Event Simulation

This thesis investigated the potential of computer graphics in providing for a graphics driven specification system that gives sufficient structure and content to form the simulation model itself. The nature of discrete event simulation modelling, the diagramming method of activity cycle diagrams which underpinned this research, the three phase simulation model structure, and the trend of visual simulation modelling are discussed as the basis for the research Some current existing simulation languages and packages are reviewed, which gives insight into the essential features of an ideal computer simulation environment. The basic research method adopted was to build systems that exemplified the state of thinking at the time. The purpose of this method was to enable ideas to be developed, discarded and enhanced, and for new ideas to emerge. The research has undergone a series of application developments on the Apple Macintosh to examine the advantages and limitations of such systems.

Supervisor: Prof R Paul

AVGEROU, Chrisanthi (1989)
Information Systems in Social Administration: Factors Affecting Their Success

This thesis examines the process by which computer-based information systems are developed in social administration institutions and traces factors which appear to contribute to their perceived success or failure. Data have been drawn from social security organizations in Britain, Norway, West Germany and Greece and are interpreted based on longitudinal studies. Each case is examined in terms of a brief description of natural government system, socio-economic circumstances, the specific conditions of the social security organization and its experience with information technology. Three categories of factors are identified: those stemming from the characteristics of the national environment, those related to organizational features, and those related to the characteristics of technological choice. The analysis of the factors which affect the success of information systems changes leads to the suggestion of a conceptual scheme to improve the ability of information systems experts to direct systems development towards politically desirable, organizationally effective and acceptable, and technologically innovative and efficient applications.

Supervisor: Prof F Land