The Use of Task Analysis Methods in Support of the Development of Interactive Systems

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ABSTRACT
One of the major and continuing problems for the information technology community is the tendency to create technically excellent and advanced products, which do not meet the needs of the real users. Capturing and analysis of user requirements and tasks are concepts that have frequently been suggested to address central problems within system development in recent years. In this research the use of a variety of Task Analysis (TA) methods has been used to assess the adequacy of a proposed design for a “World Wide Web (WWW)” system within an Interactive MultiMedia (IMM) context, domain and environment which will help research students conduct their doctoral program as carried out at Salford University, Manchester, UK. The results of the application for TA methods and their input into the design activities have been analyzed and compared both to each other and to a framework (desirable criteria). The findings have shown that TA methods have a number of weaknesses in the contributions that they make and therefore questions of how the methods can be improved to increase their capability were considered.

Keywords
Human-Computer Interaction, TA, design process, IMM, Requirement Analysis (RA), WWW.

1 INTRODUCTION
The literature review indicates, that IMM is more than a collection of multiple media: it is a complex interaction of stimuli that are intended to achieve an effect, and that the IMM systems design and development process shows some peculiarities which make it different from the “classic” software development activities, and that designers of such IMM systems should be aware as early as possible and through the development process of these constraints and peculiarities. Therefore, when developing IMM systems it is imperative that considerations be given to those different perspectives, aspects, characteristics, features and concepts that are specific to this new context, domain and environment.

While the analysis, design and development of all complex systems is difficult, IMM and “WWW” systems seem to add significant extra characteristics, features, specifications, requirements and challenges.

Design methodologies for IMM systems claim that development should ideally proceed from the first stage Requirements Analysis (RA), and should incorporate user requirements and tasks. The TA process is regarded as the most formal of available techniques for addressing such requirements. Key elements of IMM system design should therefore emerge from early analysis rather than be shaped to fit the results of user testing [3]. The specification of information requirements is a particularly important part of the RA phase since poor specification leads to poorly designed systems which in turn leads to reduce the usability of the systems [4]. The literature on requirements engineering contains little in the way of either theoretical guidance or empirical case studies relating to the specification of requirements for IMM information systems [1].

2 THE RESEARCH METHODOLOGY
The basic idea behind the case studies were based on applying the selected TA methods in order to find out how Ph.D. research students conduct and plan their doctoral research from the start to the final step, writing up the thesis, and to find the variety of problems and difficulties that they are facing. The results of using TA methods were collected and analyzed, compared and tested to an Evaluation Framework (desirable criteria) in order to find out whether their outputs were capable enough to support the RA phase and to contribute effectively into each design activity of WWW system. The case study approach was selected for this research strategy as the most appropriate method because of the following: “Why” and “How” questions are being posed in the research questions, the case study as design strategy is highly pertinent with purpose and objectives of the research effort, and the researcher favored using case studies as the phenomena can not be studied outside the content in which they naturally occurred. Case study approach gives an opportunity to study the aspects and concepts of TA methods’ problems in some depth, and it allows us to concentrate on the
The contributions that are required from TA methods
representation form and support,
the scope “generality” of the analysis,
were then compared and analysed under the four main
have been used and applied within the application area
tested empirically. The products of those TA methods that
methods should ideally meet was outlined theoretically, and
the information that should be contributed and supported by
systems design process and mapping the specifications into
design activities).
3 THE EVALUATION FRAMEWORK
The Evaluation Framework (EF) aimed to relate the scope
TA to IMM systems design, in order to assess how
capability of such methods could be evaluated and then
improved. There is, a need to address the features that are
lacking within the current TA methods, these features
would make TA methods more appropriate and capable for
IMM systems design. Therefore, the EF was concerned
with any issues, aspects and concepts that can help to
examine and explore the capability of TA techniques to
contribute to (i.e., capture and support the specific features of
IMM approach; and to communicate the essence of the
design) directly into the analysis and design of IMM
systems. Having established the importance of analysing
the information that should be contributed and supported by
the RA phase and in particular TA methods for each design
activity, a defined schema of desirable criteria which TA
methods should ideally meet was outlined theoretically, and
tested empirically. The products of those TA methods that
have been used and applied within the application area
were then compared and analysed under the four main
factors of the EF:
  • The Scope “generality” of the Analysis,
  • Representation Form and Support,
  • The Contributions that are required from TA methods
    in terms of (What, Where & How),
  • Core Criteria for TA Products and Applications in
terms of understandability, correctness, usability and
validity.
Each factor represents issues; specific and desirable
features for IMM approaches as well as showing
where/how TA methods should cover and represent these
features in their outputs.
4 REFLECTIONS ON THE USED TA METHODS
The reviewed and used TA methods, generally provided
descriptions that are user-task centred, they offered little
support in order to contribute into the RA phase and to
guide the design activities. Translations from user-task
information into system design recommendations were
completely dependent on the analyst’s craft skills, expertise
and creativity. The used TA methods have shared the same
implicit problem that, it can be hard to know when to stop
the analysis process.
Although HCI discipline claims the role of TA, and it
should be the sole arbiter of the style and structure of any
system design. The reviewed TA methods were not capable
enough to pose and convey their richness of information to
be utilised by the rest of the development activities.
However, using the factors that have been discussed and
outlined in the framework we can classify the reviewed TA
methods. Thus allowing us to identify the support,
contributions and capability of such methods, as well as
helping to identify some of their distinguishing features,
and thus maybe to support comparisons between them.
Identifying TA’ weaknesses (i.e. their limitations – support
and contributions) in this way it may help to produce
features, criteria and factors that could be used to indicate
ways “areas” in which TA could be improved.
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