Control of information flooding and mode confusions: lessons from major engineering projects

W. Ian Hamilton[1], Joanne Stokes[1], & Graham Kenyon[2]
[1]Human Engineering Limited, Bristol
[2]Ultra Electronics Airport Systems, Manchester
United Kingdom

Abstract

The application of human factors practices to any systems development project should eliminate, or at least significantly reduce the risk of information overload or control mode confusion errors. Although human factors can enhance requirements capture and the anticipation and control of errors, the final quality of the system interface may be fixed by system design limitations unless these match user needs. Even where human factors techniques are applied to systems engineering, the translation of functional and task goals into design requirements may be of insufficient resolution to define necessary display performance characteristics. The resulting incompatibility of display performance and user needs may be realised only at the verification stage: too late to alter the design and leading to the delivery of an inadequate solution. This paper presents a technique for the specification of interface requirements, including detailed display performance characteristics based on task analysis data. The technique can be implemented as a simple database for display graphics rationalisation, and includes a comprehensive set of prompt fields for the capture of information and input requirements. The database, known as the Interaction Requirements matrix, can also support a basic assessment of the feasibility of the proposed interaction task. This is achieved using a GOMS style of analysis of unit task execution times, that are summed for a given interaction session or operational scenario to provide a time occupancy estimate of workload.

Introduction

Display and control systems are now widely used in supervisory control and monitoring situations. This is true not only in traditional process control applications but now too in large-scale facilities management applications. For instance in Heathrow's Terminal 5 the main control room houses a systems integration suite of displays that support operational and security monitoring activities, as well as facilities management, trouble-shooting and incident management tasks.

In D. de Waard, G.R.J. Hockey, P. Nickel, and K.A. Brookhuis (Eds.) (2007), *Human Factors Issues in Complex System Performance* (pp. 411 - 421). Maastricht, the Netherlands: Shaker Publishing.