Chapter XLII
Human Factors for Business Mobile Systems

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ABSTRACT

Technology has to be fit for purpose in order to deliver its promised business impact. An important component of this is making sure technology offers its intended users the functionality they require in a manner appropriate to how they want to achieve their goals. This chapter presents an area of science, human factors, with particular relevance to developing and deploying business mobile systems that are fit for purpose. The value of human factors is discussed, before moving onto some general guidelines to ensure that a mobile technology is suitable for its users. Finally, each system, each application, and each user should be taken on their own merits. To achieve this, it is critical to take an approach that puts users at the heart of requirements, build and deployment of a new technology or service. This approach is presented as a three-stage model of context analysis, specification and design, and evaluation.

INTRODUCTION

Mobile technology is now delivering new opportunities in the business arena, with two critical characteristics

- **Portability:** The size of many mobile devices allows them to be taken to, and used in, an almost infinite range of locations and situations.
- **Connectivity and communication:** Typically, these devices are primarily for communication (e.g. the mobile/cell phone or Blackberry-style email client). This is being combined with increasing processing power, and therefore increasing functionality of applications on the device, to make rich and complex user experiences.

We are probably only beginning to scratch the surface of how such devices can be used to support business tasks, but this power comes with limiting factors. The portability of devices means they have to be small, yet support a complex range of user inputs and device outputs; their versatility means that interaction must be possible in environments that impinge on the user's experience much more than the relatively calm and constrained surroundings of the average office, and the new complexity of applications must be presented in a way that hides the complex interplay of device resource sharing, switching between applications, and changes in network connectivity that is occurring behind the scenes. Most important of all, mobility demands that the technology is fit for purpose within the context of use, to the point where aspects of its functionality should be made invisible for a given context (Bergman and Norman, 2000; Pascoe, Ryan and Morse, 2000).

In the following, the field of human factors, and its contribution to developing fit for purpose technology, is presented. This is followed by guidance on how a human factor approach can be applied to the design, development and management of business telecommunications – specifically mobile business applications. This guidance is presented in two parts. The first part covers key human factors considerations for effective mobile business applications. The second part, presents the steps to follow within an iterative user-centred design process, to make sure the mobile business application meets the needs and abilities of potential users. These two parts are complementary in that key human factors considerations should be considered within the development process. This guidance is summarised in Figure 1.

Future directions for the field and concluding comments are then presented.

BACKGROUND

Combining the capabilities and constraints of mobile technology in an effective manner makes for a seamless experience and a powerful work tool. This quality is commonly referred to as usability – "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use."(ISO 9241-11, 1998). Usability ensures that people will have the objective outcomes of greater productivity, better efficiency, and fewer errors, while having the subjective experience of greater confidence and satisfaction in terms of achieving set goals, and a greater propensity to re-use a product.

Achieving this is not a trivial task. All too often, mobile projects focus on getting the technology to work as a technical challenge, but less on ensuring that it is designed to fit with how users operate. This may offer a significant risk to a project. At worst users will completely reject mobile device or service (either as a whole, or as a specific ap-

Figure 1. Human factors guidance for mobile business applications