

# *A survey of usability engineering within the European I.T. Industry – Current practice and needs*

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**The present paper reports on a survey of current practices in usability engineering and requirements for support within European I.T. organisations. Responses were obtained from 84 individuals working in nine European countries. The data were analysed in terms of four themes: respondents' background, their interpretation and appreciation of the concept of usability, current practice with regard to usability evaluation, problems and requirements for support in conducting usability evaluation. Results suggest widespread awareness but only superficial application of Human Factors methods in Industry.**

**Keywords:** Usability engineering, usability evaluation tools, industrial survey, industrial practice, usability laboratories, HCI guidelines and standards

## **1. Introduction**

Usability is now recognised as one of the most critical quality factors for a successful I.T. product. Human factors (HF) contributions to the design of more usable systems have traditionally focused on providing inputs to design in the form of user interface design guidelines and standards as well as user and expert

based trials. More recently HF effort has focused on the entire development process and contributions have been made in terms of providing methodologies and tools for Usability Engineering. The Usability Engineering approach involves setting usability goals for the product on the basis of user and task analyses and evaluating prototypes or simulations of the system as critical stages throughout the design cycle to determine achievement of those goals (Gould and Lewis, 1983; Whiteside, Bennett and Holzblatt, 1988; Shackel, 1991)

If HF tools are to be successful in their uptake within I.T. development they must be driven by designers' requirements and be applicable within the constraints of the designers' world. Developers will have their own established procedures, time constraints as well as varying resources to devote to usability evaluation. Perhaps more importantly their perception of the benefits of usability engineering will determine how much they will be prepared to invest in usability methodologies and in performing evaluations.

The present paper reports the results of a survey on usability engineering within European I.T. organisations. The survey is essentially an analysis of designers' current practices and requirements for human factors tools. The objective of the survey was to conduct an analysis of the procedures and tools which designers were currently using and would potentially use in order to improve their products' usability. The data were sought within the context of ESPRIT project 5429 MUSiC (Metrics for Usability Standards in Computing) so that the HF tools developed in the project reflected real needs and could be tailored appropriately for easy assimilation into existing design practice.

## **2. Industrial Needs Survey: development, pilot test and completion**

An initial pool of items based on questions which addressed industrial practice and requirements with regards to usability engineering was developed and refined. A pilot version of the survey was finalised and tested on a selection of experienced HF researchers and designers. This test highlighted any further problems with the survey and the final version was modified accordingly and formatted before release.

Target respondents to the survey were identified by the present authors with help from project partners on the basis of previous communication, work involvement and personal knowledge. No formal selection procedure was applied save that they were known to be involved professionally in the HF domain or to have an interest in it from a technical design perspective. Only individuals known to speak fluent English were selected.

The final version of the survey contained 24 questions with space for additional comments by respondents. This reflected the philosophy of investigation which was open-ended, seeking all relevant information that respondents felt appropriate to provide rather than constraining the answers by limiting the

number and range of possible answers. Respondents were sent a copy of the survey and an explanation of its purpose.

### 3. Survey data

The survey data are presented below according to four basic themes:

- respondents' backgrounds and work;
- interpretation and appreciation of usability;
- current industrial practices in usability assessment;
- problems and requirements for support in usability evaluation.

Statistical treatment of data consists in the main of basic summary statistics. Open ended responses were categorised, frequency counts were made and translated to percentages where appropriate.

### 4. Background of the respondents

A total of 184 survey forms were sent out, of which 84 (45%) were returned, covering 9 European Countries. The range of company types surveyed is shown in Table 1.

Software houses and Computer manufacturers	27%
Industrial HCI (research) units	22%
Public companies, Government Departments and PTTs	18%
Consultancy companies	23%
Academic HCI research units	2%
Other (mainly manufacturing)	8%

Table 1. Survey respondents grouped by company type

Respondents described their primary role within the organisation. The relevant responses are presented in Table 2. Interestingly, only 15% of respondents described their primary role as "Human Factors" professional despite the fact that all were selected on the basis of their known involvement or interest in usability assessment. Other smaller roles ( $n < 2\%$ ) cited in the survey were "user groups" and "user support/training groups."

Project management	19%
Human factors	15%
Software design	11%
Systems analysis	10%

Design consultancy	9%
Software development	8%
Software testing	8%
Quality assurance	7%
Marketing	4%
Training	3%
Procurement	3%

Table 2. Survey respondents grouped by primary work role

## 5. Interpretation and Appreciation of Usability

### 5.1 What is usability?

Since the survey was concerned with usability practices in I.T. organisations, an initial question asked respondents to describe in their own terms, their understanding of the concept of “usability”. All responses were noted and compared (n=81).

The responses were wide ranging as indicated in the following sample:

“Consistent, intuitive, easily learnt, helpful with error status reporting.”

“Should be usable by an unskilled user with nearly no learning phase.”

“The ability of the end-user to fully exploit system functionality with the minimum training, reference to manuals or being fearful/reticent.”

“Doesn't need a large manual.”

“An intuitive interface for the user to access the data.”

“People ‘want’ to use the product.”

As can be seen, such responses convey a generally agreed view of what design for usability seeks to effect but vary both in terms of precision and in operationalisability. For example, stating that the manual should be minimal is relatively unambiguous and measurable; stating that the interface should be “intuitive” is less so. Both might be important variables for usability but it is debatable that they constitute adequate definitions of the concept.

A common conception throughout the definitions was the reduction of the need for investment in training and learning time. Many respondents regarded a usable system as one which required minimal training, allowed rapid learning and for which there was little need to refer to manuals i.e., “intuitiveness” or

“transparency” to the user. In all, 26% of respondents made explicit reference to ease of learning or minimal training in their definitions of usability.

Many of the definitions were circular or uni-dimensional. Usability was variously equated with “operability” (in other words it is usable if it is operable); “good” (it is usable if it has a good user interface); “use of metaphors” (presumably if the interface is based on one it becomes usable) or with user-centred design. One respondent claimed to use the term “usability” interchangeably with “HCI”, suggesting a less than clear conceptualisation of the domain.

The term does seem to evoke some cynical views. One respondent described the term as “vacuous and hollow” and “to be avoided”. Others see it as synonymous with particular products. As one respondent put it: “in popular terms it means Windows!” Still others don’t seem to have moved on from a view of the concept as trivial or an idealised, feature-based requirement – “means you can key in English not odd little characters” or as a prescription to follow – “usability means F1 provides context sensitive help and ESC goes to the previous level”. One respondent defined usability merely as the provision of a “well-indexed user guide”.

In the main, these definitions demonstrate a view of the concept which equates it with ease of use and makes reference mainly to the criterion of learning speed. Terms such as “intuitive”, “consistent” and “helpful” are familiar but far from unambiguous and unlikely to lead to an agreed definition between designers or users. To an extent this reflects the vague nature of the concept (“we know what it is but we’re not sure how to define it”), but more importantly it suggests that much human factors work in the last decade or so has failed to define the concept adequately for those designing systems. However, only three respondents failed to propose a definition of the term. This means that the concept is known and discussed which at least means human factors issues have achieved a status of familiarity in contemporary I.T. organisations.

## ***5.2 How important is usability testing and understanding the intended context of use?***

When asked to rate their organisation’s views on the importance of usability evaluation in design or procurement of I.T. systems or products, 52% of the respondents reported that their organisations regarded usability evaluation as ‘very important’ or ‘essential’ (see Table 3 under Evaluation). While these are encouraging data it must be noted that almost 1 in 5 (19%) of respondents still felt that their organisations viewed such testing as either ‘unimportant’ or ‘not essential’.

Respondents were also asked how importantly their organisations’ rate knowledge of the context in which the system is intended to be used (i.e., the

types of users, tasks and environment the product will face) when designing or procuring a product. The results are also presented in Table 3 under Context.

Over 90% of the sample regarded a knowledge of the users, tasks and working environment as ‘essential’ or ‘very important’ when designing or procuring I.T., indicating a high level of appreciation of contextual variables in determining the usability or suitability of a product. This is encouraging news as it suggests respondents in the I.T. world have a realistic view of the situated nature of usability and its determinants.

<b>How important is:</b>	<b>Evaluation</b>	<b>Context</b>
Essential	22%	71%
Very important	30%	22%
Important	29%	2%
Desirable but not essential	17%	5%
Not very important	2%	0%

Table 3. Ratings of organisations’ emphasis on evaluating usability and understanding context of use

The *type* of contextual knowledge required by the respondents was also explored. Respondents described their ‘wish-list’ for information under three broad headings: knowledge of users, of tasks and of environments. These data were noted, grouped and counted and the results are summarised in Table 4. A major problem with these forms of data is distinguishing the respondents’ implicit meaning in their written answer. The responses “I.T. background”, “knowledge” and “experience” under the User heading could, in theory, all refer to similar information about the user or could refer to distinct types of knowledge and experience (e.g., task knowledge or job experience). It is impossible to make decisions reliably on the basis of written response thus distinct scores for such categories are reported.

Obviously no one item of information on any variable was considered essential by all respondents but clear patterns do emerge. Most noticeably, users’ background in computing and their level of skill are considered important factors by many professionals as are the procedures and frequency of task performance. These conform to the basic concepts many HF professionals would regard as central to context description.

<b>User</b>	<b>n</b>	<b>Task</b>	<b>n</b>	<b>Environment</b>	<b>n</b>
I.T. Background	27%	Procedures	23%	Physical layout	15%
Knowledge/skills	24%	Frequency	16%	Noise	14%
Experience	21%	Sequence	11%	Light	14%
Age	15%	Goal	10%	Social structure	10%

User type	12%	Complexity	7%	Organisation type	10%
Motivation	12%	Autonomy	6%	Hazards	7%
Physical ability	11%	Inter-related tasks	4%	Hardware	7%
Qualification	11%			User support	5%
Gender				10%	
Cognitive ability				9%	

Table 4. Type of contextual information considered useful by respondents

In summary therefore, with respect to current conceptions of usability the typical respondent can offer a general definition only but considers ease of learning (with little requirement for training or reference to user manuals) as very important. Respondents' organisations view usability as an important aspect of product design for which relevant information on user, task and environmental characteristics must be obtained. This information should include users' background and experience, the task procedures and frequency of occurrence and provide some details of the intended physical environment of use.

## 6. Current practices

While the field of HCI can be seen as entering its third decade of research effort, to date there have been few published reports on industrial practices in user-centred design. The items in the present study specifically sought information on procedures and facilities for usability testing in contemporary software design across Europe in order to provide the HF community with feedback from industry.

### 6.1 Dedicated Usability Resources

In terms of facilities and personnel available, Table 5 illustrates the resources which are prevalent within organisations.

Do you have:	Yes	No
Dedicated evaluation staff	46%	54%
Dedicated room/facility	26%	74%

Table 5. Usability resources in I.T. organisations

It seems that organisations are more willing to invest in dedicated staff than dedicated facilities which may provide some insights into the manner in which evaluation is performed. Only 19% reported that they had both dedicated staff **and** facilities and 6% reported having actually having dedicated facilities **without**

employing dedicated staff. In the latter case the laboratory facilities are used mainly for company promotional activities rather than product evaluations.

## **6.2 Form and occurrence of usability testing**

When asked to indicate when in the generic product life cycle (PLC), usability evaluation is usually conducted, the responses emphasised ongoing work throughout the PLC, with a slight emphasis on the specification and working prototype phases (see Table 6).

While the early emphasis on usability testing conforms to the basic philosophy of user-centred design, it is interesting that less than half the respondents claimed to do any usability evaluation at the alpha or beta test stage when the product is close to the form in which it will eventually be released. In fact, the alpha and beta test stages were the lowest rated stages for testing in the generic PLC presented in the survey.

<b>When is usability tested in the PLC?</b>	<b>n</b>
Product specification	58%
Rapid prototype	45%
Simulation/Working prototype	65%
Alpha product test	43%
Beta product test	43%

Table 6. When is usability tested?

A variety of evaluation methods seems to be employed also. In response to an item asking what procedures were followed in usability evaluations within their companies, 75% claimed to involve representative end users and almost half (49%) reported that HF consultants were brought in to help. Perhaps most positively, 60% claimed their products were evaluated through formal user trials involving the performance of specified tasks. These data suggest a very high level and repetition of user testing, again in conformance with the user-centred approach to design which is encouraging.

The picture is not so clear however as can be seen when these responses are compared to related items (see Table 7). Only 17% of respondents claimed to have a mandatory procedure for testing usability while 75% of the respondents said their company usually relied on informal testing, which is disappointing albeit unsurprising. Furthermore, over half the respondents (51%) reported that evaluation by the designer was their established procedure. However the potential for formalism is shown by the fact that 68% stated that their organisations followed Quality Testing Methods (e.g. ISO 9000) for product development. While there is no doubt that many designers can carry out useful evaluations, experience within the HF discipline suggests that objective



evaluations by trained ergonomists are likely to be far more effective at identifying problems and recommending improvements.

Also of concern is the low occurrence of dedicated evaluation facilities and staff. One would presume these to be essential for many of the types of testing claimed to be carried out. Of those claiming to perform formal user trials (60% of total), only 42% had dedicated facilities and only 52% had dedicated staff i.e., only half of those claiming to use the formal user-based approach seemed to have the recommended resources to do so. In fact in terms of total responses, only 18% claimed to perform formal user trials and actually had **both** dedicated facilities and staff. Even excluding dedicated facilities, only 31% of total respondents had the usability staff **and** performed such evaluations. These data tend to reflect a position where few formal user trials and evaluations occur in I.T. organisations; many evaluations being informal, non-user based tests by non-HF specialists.

Type of testing and resources for evaluation	n
Dedicated staff & facilities for performing formal evaluations	18%
Dedicated staff for formal evaluations, no facilities	31%
Product is examined by designer	51%
Employ HF consultants	49%
Mandatory formal procedure for usability testing	17%

Table 7. Type of testing and resources for usability evaluation

One possible source of explanation for this apparent contradiction may lie in the use of external HF consultants. As shown above, 49% of respondents claimed to employ such consultants for evaluation purposes at some time. When compared with the data on formal user trials we find that 74% of the respondents who claimed to perform user trials also used consultants. It is therefore entirely possible that many companies employ outside consultants to perform user-based trials which may explain the high reported occurrence of formal user trials despite the lack of necessary dedicated facilities in-house. Another approach is described by Cantwell and Stayano (1985) where IBM have a human factors laboratory in Rome which provides an evaluation service to four European software development centres.

However, if we examine the data from the respondents who work in the consultancy field (23% of total) we find that while 57% of them perform formal user trials as part of a usability evaluation service only 19% of them have the dedicated facilities for usability evaluation. Assuming these are typical of the broader HCI consultancy field, we can conclude that while the use of outside HF consultants to perform usability evaluations may be commonplace, there are still designers and consultants who claim to perform formal evaluations with neither dedicated facilities nor specialist staff.

In summary, current practices are more informal than formal. Though dedicated facilities and staff are becoming commonplace, typical evaluations are either carried out by the designer or handed over to outside consultants. The typical respondent's impression of formal user-based evaluations does not seem to match the idealised or textbook view of usability evaluation.

### 6.3 How contextual information is gathered

Given the stated importance of identifying relevant contextual variables it is interesting to see how such information is collected in practice. Table 8 summarises the methods cited by respondents for eliciting relevant information on users, tasks and environments.

As can be seen, the interview technique is most commonly used for the elicitation of all context information. While this method is generally acceptable for many data collection purposes it is not clear that it is particularly relevant for eliciting knowledge about task performance or environmental conditions.

User	n	Task	n	Environment	n
Interview	38%	Interview	31%	Interview	30%
Client provided	14%	Task Analysis	11%	Survey	13%
Survey	14%	Specification	11%	Site-visit	12%
Assumed	12%	Survey	10%	Assumed	12%
Marketing	10%	Observation	10%	Specification	10%
Formal methods	8%	Trials	5%	Marketing/sales	8%
Specification	7%			Marketing	4%
Workshops	4%				
Trials	5%				
HF. consultant	4%				

Table 8. How information on context of use is collected

There is a heavy reliance on client-provided information (14% use this for information on users), assumed knowledge (this category refers to answers of the form “we generally know our users from experience” or “I am a user”) and information from marketing departments. Except for accurate client-provided inputs such as sound market research, it is unlikely that such information would provide the type of details generally regarded as appropriate or sufficient for analysis or design purposes.

Human Factors consultants and advisers were also poorly used for this purpose which is interesting given their stated high rate of use for evaluation (see Table 7). Such distinction in use of specialist HF inputs highlights the age old problem

of HF professionals who regularly complain of being called in late in the PLC rather than early when they could have most impact.

In terms of information on tasks it is perhaps disappointing to note that only 11% of respondents claimed to employ any form of task analysis technique. A similar 11% reported that the product specification provided them with the required task information while almost half as many relied on inputs from the marketing personnel. These results might reflect the data categorisation here in that many respondents may equate interviewing or observation with task analysis. If we accept this, then obviously task analysis is used far more frequently than the 11% total suggests. Against this it must be pointed out that while straight observation or interviewing may elicit information about tasks neither is analytical, at best providing only task descriptions.

### **6.4 Organisational type and usability practices**

In order to highlight the variance in responses to the survey items, in terms of the types of organisations which were involved, the data in table 9 are presented. Of all organisation types, software houses and computer manufacturers seem to treat usability most seriously as assessed by such variables as dedicated staff, dedicated facilities and the use of Quality Management Systems (QMS). Greatest variance in response emerges from the question on the importance of usability evaluation in application development. The organisations grouped as PTT, Government departments and Public Utilities view evaluation as much less important than the other groups surveyed. Yet these all rate contextual knowledge as essential or very important and a relatively high proportion of them have dedicated HF personnel.

<b>Usability practice</b>	1	2	3	4	5
Operate a Quality Management Procedure	<b>86%</b>	65%	58%	55%	80%
Context of use - essential / v. important	82%	<b>100%</b>	90%	75%	84%
Usability evaluation - essential / v. important	72%	30%	58%	55%	<b>83%</b>
Dedicated facilities	<b>35%</b>	20%	21%	31%	17%
Dedicated HF personnel	45%	41%	48%	<b>50%</b>	17%

- Key:
- 1: Software house & computer manufacturers
  - 2: PTTs, Public Utilities and Government depts.
  - 3: Consultancies
  - 4: Academic and industrial HCI research units
  - 5: *Other*

Table 9. Usability practice by organisation type

In summary, current design practices indicate strong reliance on Quality Management Procedures across the software and computer houses and in manufacturing organisations. Contextual information is also perceived to be of high value by all of the organisations in designing for usability. However, evaluating product usability and investing in dedicated staff and facilities is not universally seen as so important.

## 7 Problems and requirements for support in usability evaluation

Even with an awareness of and commitment to usability issues in design, the development team faces a host of real-world constraints on their activities which limit their abilities to develop in a user-centred fashion. This issue has often been overlooked or been paid lip-service by HF researchers who have proposed a range of tools and approaches to user-centred design with little or no explicit reference to the real-world constraints within which developers have to work. In the present investigation respondents were asked to select from a list of potential constraints and to add any others they felt relevant. The results are summarised in table 10.

<b>Difficulties in performing usability evaluations</b>	<b>n</b>
Limited time and resources	64%
Lack of usability metrics	39%
Limited skilled HF staff	39%
Lack of sound methodology	29%
Access to suitable end users	27%

Table 10. Difficulties reported as actual or foreseen in performing evaluations

Limitations on time and/or resources were cited as the main problems by almost two-thirds of respondents. The lack of available usability metrics and skilled HF staff were rated as the second most important problem. Finally, the lack of a usability methodology or access to real users were cited as problems only by approximately one-third of respondents.

These results are interesting in several ways. The lack of time and resources for evaluation support the earlier data on resources in industry which indicated that the majority of respondents worked in organisations without dedicated staff and facilities for usability testing (see Tables 5 and 7). Given this, the lack of time may reflect the status of such evaluations which seem rarely to have formal status within the PLC, and may indicate that system developers themselves feel they do not have sufficient time to do the evaluation (which many claim to do

usually anyway). As one respondent put it: “Lack of resources puts the pressure on to build the product not a model.”

The view that usability is difficult to measure gains support from the finding that almost 40% of respondents perceive the lack of metrics as a difficulty. Quantifying human factors concepts is seen by some as a way of improving their take-up and usage in industry. These data support such an argument. Presumably system developers would like to be able to “score” products in terms of usability and set targets for design akin to other quality variables.

Lack of a sound methodology and gaining access to suitable end-users were cited as problems by almost one-third of respondents. The lack of methodology for usability evaluation is not surprising given earlier data but it is not clear whether this is a cause or an effect of the reliance on informal testing or examination by designers. Other categories of problems referenced were identifying tools and methods for data capture and abstracting design recommendations. When asked to identify the main evaluation support needed, the responses listed in Table 11 were offered.

That designers still view guidelines as useful and desirable is telling in two ways. Firstly, many human factors professionals might feel that such guidelines already exist and have done for years. The literature on HCI is extensive and replete with supposed advice for designers. However this issue is more complex than it first appears. Though an extensive literature exists it is far from clear that designers actually read this literature (see e.g., Buckley 1989) or that even if read, little of what is written can be immediately employed by designers in practice. One respondent explicitly stated that abstracting design recommendations was problematic. Furthermore, many human factors practitioners are of the view that guidelines by definition are prone to be context-sensitive and thus easily mis-applied.

The desire for guidelines, coupled with the desire for training in usability engineering which was expressed by almost a third, may indicate a resistance to exposing work to non-designers for evaluation and the feeling that usability can be handled by designers themselves rather than dedicated specialists. As one respondent put it, there is a problem “overcoming designer resistance to recognise failures in their designs and perspectives.” The demand for standards by almost half of the respondents is further evidence that designers would like targets to aim for that can be quantified as discussed above. As one respondent put it: “we need standards to help define objectives”.

<b>Support for usability evaluation</b>	<b>n</b>
Guidelines on designing for usability	54%
Standards for usability testing	46%
Training courses on usability engineering	29%

Resident HF expert in design team	25%
External HF expert involved	23%

Table 11. Forms of HF support considered useful by respondents

Two other support requirements were expressed that were typical of the present sample: planning effective evaluations/interpreting the results, and estimating the cost-benefits of human factors work. It is perhaps not surprising that both of these were frequently volunteered by respondents. Evaluation planning and interpretation are heavily skill dependent and traditionally, both have been strengths of the HF professional. Software designers are not trained in these areas so it is to be expected that when faced with the task of evaluation they see these as areas where they require assistance. Once more though, it may highlight a desire to perform and interpret evaluations themselves rather than hand a product over to specialist evaluators.

Estimating the cost-benefits of user-centred design principles is an issue that has proved difficult to tackle. This is not the place to discuss the issue in detail but it is important to realise that it is a yardstick against which ergonomic inputs are increasingly measured in the real-world.

In summary, respondents cite lack of time and resources as the major drawbacks to designing for usability although quantifying usability, planning effective evaluations and establishing the cost-benefits of usability evaluations were also raised as issues. Respondents place high value on guidelines and standards for design as sources of support.

## 8. General discussion

It seems clear that usability and user-centred design are familiar concepts to the respondents in this survey. That holds across professional domains and European countries. Particularly pleasing from a HF perspective is the awareness of the contextual nature of usability and the importance of understanding the range of user, task and environmental variables that influence the interaction between a technology and its users.

The definition of usability and its operationalisation for evaluation continue to pose problems. This is particularly worrying since an inability to operationally define usability surely reflects on the type of practices that are followed in evaluating it. Many still see usability less as a component of total product quality than as an attribute of the interface that can be prescribed such as “using Windows” or making “F1 mean context-sensitive help”. Such a view severely limits the potential application of HF knowledge in design, rendering it a provider of screen attributes rather than a framework for quality design.

In many ways this finding is a model of the full results, i.e., the terms and concepts of user-centred design are known but their application remains superficial or sporadic. Thus we find that almost half the respondents' companies rate human factors and usability highly, have dedicated staff for usability testing, test throughout the product life cycle and value formal user trials highly. Yet half the respondents claim that the designers do their own evaluations, less than one in five organisations have the staff and facilities available to perform formal user trials and most lack time for testing which, in any case, is usually informal and not even mandatory. The frequent use of outside HF expertise is positive but often this is late in design and not without its own problems as outlined above.

It is worth pointing out that formal, user-based evaluations carried out in fully equipped usability laboratories by dedicated, trained staff are an ideal of the HF profession. That companies rarely meet this ideal in practice is not a criticism but a statement of fact. Indeed, in evaluating early and repeatedly throughout the PLC in a user-centred design process, HF professionals would often advocate the use of heuristic and expert-based evaluations which have been shown to provide useful information on usability issues relatively quickly (Nielsen 1992). The present findings indicate that often this is the only form of testing open to the development team (though there is some doubt that this is even what is carried out). The question that is being raised here is the extent to which some respondents are aware of the possible limitations or shortcomings in this approach or the meaning and value of truly formal evaluations.

The difficulties that respondents identify in designing for usability are quite informative in terms of the real picture in the I.T. industry. Despite all claims for company commitment to usability, time and resources for evaluation are still limited according to almost two-thirds of respondents. When asked how they could be helped to evaluate usability the most popular reply was to request guidelines on designing for usability.

In part at least, these problems can be seen as a weakness of the human factors approach to product design. The concepts and methods of the discipline are often ill-defined and craft-like and the benefits and costs of precise inputs and outputs difficult to demonstrate; as a result it is easy to claim adherence to the user-centred design philosophy without making a genuine effort to change existing procedures to accommodate proper usability testing. The development of metrics and standards for usability would surely help here as would any firm evidence on the financial benefits of developing more usable systems. These must be the areas in which future work lies.

For the HF discipline these results are mixed. While it can take some credit for raising awareness of usability issues in the I.T. industry, the discipline has failed to capitalise on this in terms of bringing about true user-centred design processes. Obviously there are many obstacles here but a worrying tendency is the superficial nature of usability and HF expressed by many respondents. In

itself this is not a serious problem; after all, we do not expect all participants in the PLC to have deep knowledge of computer science, electronics or even sales. But allowance is made in the design process for these disciplines to have their input in a way that is rarely made for human factors.

As a result, the HF discipline has responded by trying to “give itself away” and provide tools and guides for non-specialists to apply in the hope that designers themselves will be able to apply ergonomics. Without suggesting that this perspective represents a view of the discipline’s techniques and methods as inherently simple and applicable with minimal or no training, it is not surprising that recipients of such knowledge transfer acquire only a superficial understanding of the discipline.

From the discipline’s perspective, some optimism may be drawn from the finding that customer acceptance criteria play an important role in determining a product’s release. If the HF community could influence the purchasers or commissioners of products to make more explicit their needs then greater emphasis on usability would force its way into the design process. The designers, after all, are only attempting to build what the client claims to want. This is another possible area for further work.

It is of course important to emphasise that this survey is but a first step in identifying what is happening and suffers its own shortcomings. For example, the data obtained on current practices are open to interpretation. Similarly, the data on contextual information required and obtained proved difficult to categorise with certainty given the variance in response terminology. Face-to-face interviews and direct observation of design practice would be far better but there exist obvious obstacles to their employment in the real-world.

The findings are interesting however, not least as a snapshot of current practices in design for usability across the European software industry. Even if these practices rarely meet the idealised view of user-centred design advocated in textbooks they do demonstrate at least an awareness of and commitment to the approach. It is the job of HF researchers and tool designers now to fit their outputs to the practices of designers and evaluators at the sharp end.

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