

Standardisation of Global Telecommunication Services - Expertise or Market Shares?

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Abstract -- Standards are one of the key components of information technology today. Yet, despite their public and widespread implications, the underlying standardisation processes are something of a "black box" to outsiders. This begs the question how standards are determined, and by whom. The paper will look at the lowest, and most technical level of this process, where the basic technological decisions are made. The results of a survey of standards professionals and standards users are presented and analysed. We examine the composition of international committees charged with defining and maintaining standards for electronic mail systems, report the views of senior committee members, including their opinions of the process, how it could be improved, and their reactions to increased user representation. We then present and analyse corporate users' views on participation in standards setting. Finally, the implications of our findings for standards setting are discussed and recommendations made for addressing the problems revealed.

I. INTRODUCTION AND MOTIVATION

Technical standards continue to play a major, if controversial, role in the development of information technology (IT). One particular debate surrounds the question of whether standards actually foster or are an impediment to technological progress and, in the latter case, how standards organisations should respond. Standards organisations face a dilemma, between a pragmatic route of pursuing basic, 'lowest common denominator' standards which can be developed and adopted relatively cheaply and quickly, and embarking upon more long-term development of more complex or more encompassing standards. International standards organisations have often pursued the latter. The desire to please everyone is frequently reflected in attempts to reconcile diverse requirements by allowing a variety of options -- which may lead to systems which conform to the specifications, yet are unable to interoperate [1]. Such time-consuming processes also carry the danger of producing specifications which are quickly rendered virtually obsolete through the failure to consider the latest technical developments. Even worse, slow standardisation is a major obstacle to progress, as systems designers will be reluctant to adopt non-standard solutions [2]. On the other hand, the pragmatic strategy -- i.e. of addressing relatively small standards issues through rather informal working groups -- adopted within other

standardisation bodies such as for example the Internet community yields quick results, but may leave a number of standards users unsatisfied because of its somewhat 'patchwork-like' character.

The decision-making procedures followed by standards organisations may also have a significant impact on another important issue -- who are the participants in standards setting and what criteria do they consider in their deliberations? This question is becoming all the more important, as standards are a prerequisite for the global interoperability demanded by the crucial and rapidly growing market for business telecommunications services such as e-mail and electronic data interchange (EDI) and these services, in turn, may have a major influence upon organisational effectiveness and efficiency (see eg. [3, 4]). The increasing reliance of business upon such services raises the question of whether user organisations are able to participate effectively in standards setting processes and thereby to ensure that their requirements will be met. In this paper, we highlight some aspects of this problem, using the standardisation of telecommunication services as an example. It should be noted, however, that the picture presented is very much a European one, and may not hold elsewhere.

Traditionally, development of communication services has almost exclusively been technology driven, with the result that the services offered have tended to reflect the providers' and/or implementors' priorities, like e.g. manageability rather than usability [4]. This can largely be attributed to the fact, despite the very public nature of standards, the relevant standardisation committees have typically been dominated by 'market shares' -- i.e. the major vendors and service providers -- with only token participation by other parties [5].

In the wider arena of IT systems design and development, there is now an acknowledgement of the need to compliment technical knowledge with broader conceptions of relevant expertise -- especially that of users with their knowledge of applications and organisational contexts -- if systems are to meet their goals, and this is reflected in concerted attempts to increase user participation [6].

The goal of our present study is to examine the extent to which the traditional dominance of market shares still holds, or whether the claims that standards setting is becoming progressively user-led are in fact true. Taking electronic messaging services as an example, we report here findings from interviews conducted with members of standardisation committees responsible for messaging standards.

We will take a closer look at standardisation work groups where the actual technical specifications are being produced. We will report, analyse and discuss opinions, ideas, views and speculations of senior members of the relevant technical working groups of major standards setting bodies. This will provide insight into how members of the caste of 'standardisation professionals' see themselves and their roles, and their opinions concerning standards setting processes and procedures. By airing the views of individuals actually involved in the technical part of the standardisation process -- views which are sometimes very different from, and critical of, the official positions and claims of standardisation bodies -- we hope to provide a more realistic and more detailed picture of standards setting processes than the one generally held.

The remainder of the paper is organised as follows: after a brief description of the methodology employed (section II) we discuss the relations between the different stakeholders in the standardisation process (section III). Section IV provides an in-depth description and discussion of the standardisation-related aspects we found most important. This is followed by a discussion on how these findings may help answer the question raised in the title (section V). Finally, we conclude with some recommendations for improving user participation in section VI.

II. METHODOLOGY

The opinions of representatives from standards organisations and user companies were surveyed through questionnaires and face-to-face interviews. The former were drawn from members of relevant committees from ITU (the International Telecommunications Union and ISO (the International Organisation for Standardisation).

With respect to users, the study focused on large, globally operating enterprises, as it was assumed that these would be more likely to be involved in standardisation issues. Membership in user organisations -- e.g. the European Electronic Messaging Association (EEMA) -- was another selection criterion, as it was felt that such membership would be indicative of a higher than average degree of interest in the subject. Eight face-to-face interviews with representatives of large, internationally operating companies from very different

sectors, including finance, information brokering, transport, and petro-chemicals. The people selected were senior members of IT departments and also their respective company's EEMA representative.

Typically, interviews lasted between one and three hours, and focused on:

- general experiences of electronic messaging services,
- shortcomings of the systems used, if any, •how such shortcomings were overcome, and •attitudes towards participation in messaging standards committees.

Nine responses to questionnaires and nineteen face-to-face interviews with organisational representatives were analysed.

In addition, interviews were conducted with representatives of three international e-mail service providers. In all cases the interviewees selected were responsible for commercial messaging customers. The topics covered were quite similar to the above.

Interviewees from within standards setting organisations were representatives of

- ISO/IEC JTC1/SC18
ISO/IEC (International Electrotechnical Commission) Joint Technical Committee 1, Sub-committee 18 is responsible for 'Document Processing and Related Communication', which particularly includes electronic messaging. The prospective respondents were selected from the list of the sub-committee's senior members, i.e. project editors (responsible for writing up the specifications), rapporteurs (group chairpersons), and liaisons (responsible for maintaining links between different committees).
- ITU Study Group VII
SG VII is in charge of "Data Networks and Open System Communications", which primarily includes all OSI related topics, as well as numbering, addressing and, perhaps more prominent, Message Handling Services and Directory Services (X.400 and X.500 Series of Recommendations, respectively)

As members of the committee are located all around the world, this part of the survey was done through questionnaires. A total of twenty-three responses from standardisation committee members to the questionnaire, which was distributed via e-mail, were analysed.

III. RELATIONS BETWEEN DIFFERENT STAKEHOLDERS

A considerable number of different stakeholders in the electronic messaging arena can be identified. This section will look at the relations between them.

Figure 1 shows the ‘ideal’ situation, with all stakeholders having a (more or less equal) say in the standards setting process. However, this is far removed from the reality revealed by our case study.

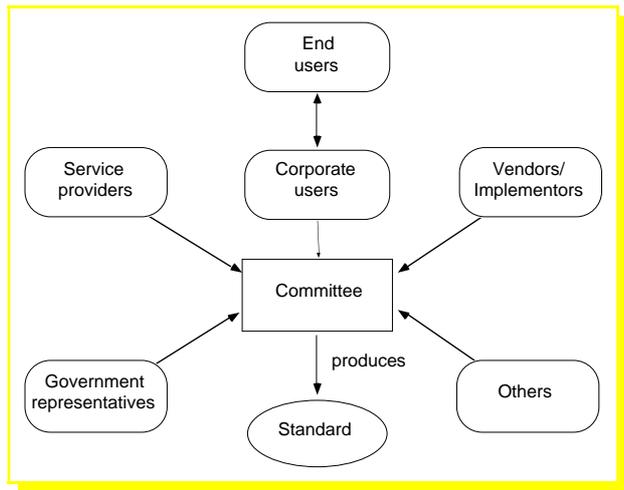


Figure 1: The Idealised Standards Setting Process

All stakeholders are users of standards in one way or another, yet have very different interests. For instance, service providers, vendors can be described as direct users of the standards, that is, they are offering services or products that implement the functionality laid down in the standards documents. On the other hand, corporate users, can be termed indirect users of a standard, as they are not making direct use of the standard as such, but of the services and products sold to them by service providers and vendors.

To some extent, this is reflected in Figure 2, which shows the picture that emerges from our study.

Indeed, it can be concluded that implementors and service providers (deliberately or not) act as a ‘buffer’ between users and standards committees (the double-arrows in Figure 2).

Whilst this seems to be very advantageous for the users in getting their short-term problems resolved in an ad-hoc manner, this also implies that established processes and procedures are being bypassed for the sake of a quick solution. As a result, one might suspect that at least some user requirements simply do not make it into the

standardisation process because of this ‘buffering’ phenomenon .

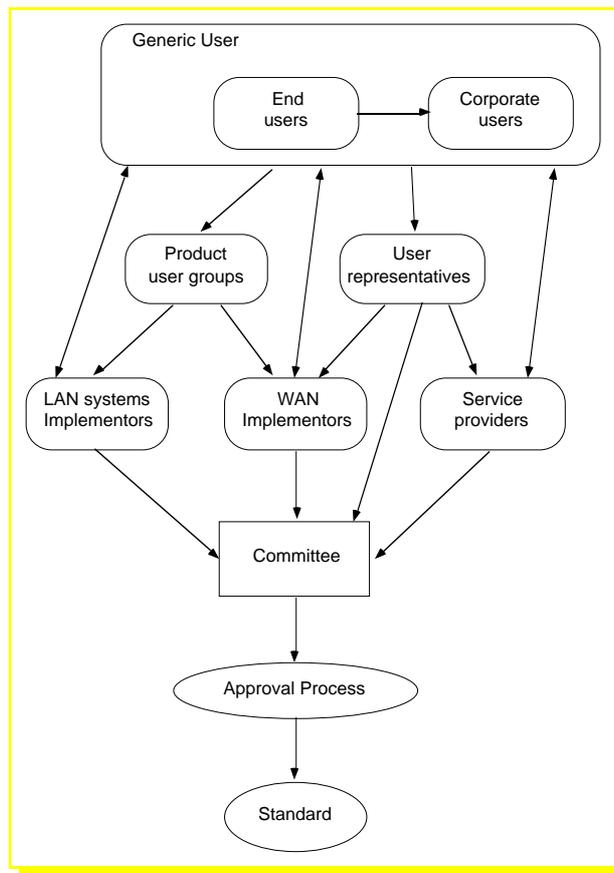


Figure 2: A More Realistic Picture

IV. THE STANDARDS SETTERS’ VIEW

In this section, we present a summary of the responses we received to the questionnaire. We begin with a brief description of the respondents.

A. The Formal Procedures

Both major messaging standardisation bodies, ISO/IEC JTC1 and ITU have established strict formal procedures on how user needs and requirements should be incorporated into the standards documents. Within ITU, responsibilities are assigned Study Groups (SGs). At present, fifteen SGs are working actively, covering the entire field of telecommunications. SG7 is, inter alia, responsible for ‘Message Handling Systems’, i.e. X.400, and SG1 is in charge of producing ‘Service Definitions’. In other words, the latter is largely responsible for identifying user requirements. However, ITU recognises the fact that requirements may as well come from other ‘technical’ groups. In this case, any

requirements identified must be sent to SG1 for approval through 'Liaison Statements'. This is a highly formalised process. Reportedly, cooperation between SG7 and SG1 worked reasonably well in the past; they had co-located meetings, and SG 1 didn't really interfere with the technical work. More recently, the co-located meetings have been abandoned, and contact is limited to the exchange of liaison statements. According to our respondents, however, user requirements have always been almost exclusively identified by technical people. An ISO committee member admitted:

"I think it would be fair to say that the majority of requirements come from the technical groups."

ISO/IEC JTC1 sub-committees used to have a similar mechanism in place. Here, Working Group WG1 was in charge, but this was abandoned in the early 1990s.

"SC18 made a big show of developing user requirements; it even had a whole working group devoted to the process. I think the effort largely failed because (1) nobody could agree on what a user was, (2) the other WGs tended to look at WG1 (the user requirements group) as an impediment, and (3) when budgets got tight, nobody could afford to send real users to meetings just to oversee a process." (ISO committee member, 1995).

Today there is a formal procedure requiring (ISO 1995a):

- the identification of preliminary user requirements as a mandatory part of a New Work Item Proposal,
- the subsequent agreement of the relevant sub-committee on these requirements, yielding a set of Agreed User Requirements,
- statements identifying how the standards document conforms to these requirements.

Our respondents reported that, in practice, this results in a process similar to that of ITU. Requirements are made up by the members of the respective technical group, and subsequently approved through some formal process. As one ISO committee member put it:

"There is a formal mechanism, prior to the development of a standardisation project. Sometimes, however, the list of requirements is prepared after the work has started."

What all this comes down to is that user needs are not seriously considered within the Work Groups. As this is the

level where the technical specifications -- which establish the basis of all subsequent steps and decisions throughout the whole standards setting process -- are produced, it is tempting to conclude that user needs have no big impact on the final standards.

B. The Committees

1) Committee Members: A closer look at the different representatives' affiliations reveals some interesting facts. In particular, it is safe to say that manufacturers, service providers, carriers and PTTs clearly dominate the committees, at least in terms of numbers.

As far as the ISO/IEC JTC1 is concerned, some 60% of rapporteurs and project editors come from the service provider/vendor side, with about 10% government and 20+% research institutions [7]. Looking at ITU SG7, things appear even more extreme: about 75% service providers, carriers and vendors, and 5-8% each for government, consultants, research institutions, plus some others [8, 9]. However, ITU's origin as a pure PTT organisation can help explain this situation -- it used to be PTTs (and equivalent organisations) only until 1992.

These statistics are not really surprising as they reflect the historical reluctance of telecommunications operators and suppliers towards the involvement of users in standards setting [3].

2) Who Dominates: The survey results made it very clear that manufacturers/vendors of telecommunications equipment, implementors of messaging standards, and messaging service providers/PTTs also dominate the process within both organisations in terms of influence.

"Service providers / PTTs are the most numerous and dominant followed by some of the key suppliers. Governments tend to only be involved in the higher level organisational decision making - rarely in the technical work." (ITU committee member, 1996).

"Manufacturers and service providers (including standard's consultants) are the major participants; it is too expensive for small companies and user groups to attend and commit the resources necessary for effective participation (one cannot be effective in standards development and only attend part-time)." (ISO committee member, 1995).

The latter quote also sheds some light on the crucial financial aspect of standardisation. Even if companies have an interest in participating, they still face the problem of how to fund

such activities. This holds primarily for user companies, and even service providers with a vital interest in the subject have been known to reconsider when economic circumstances demand cost-cutting. Indeed, financing the standardisation process has long been an issue (see eg. [10]), and this problem is particularly crucial for organisations which do not see a direct benefit from such activities. The one crucial question to be addressed is ‘is this part of our core business?’, to which user companies by and large answer ‘no’.

There is also another aspect that must not be underestimated - the role of the individual.

“The dominant influence in standards development is the individual (and their sponsoring group) who comes prepared with written contributions, actively participates as an editor, or volunteers to draft responses or contributions at the standards meeting.”
(ISO committee member, 1995).

Committees largely dominated by service providers and vendors, and heavily influenced by strong personalities do appear to provide a level playing field for user representatives, whose employers do not normally consider standardisation, or even running their own IT infrastructure as part of their core business.

3) *What Counts?*: Perhaps the most important question for many participants in the standards setting process may be ‘What is the best way to push my proposal?’ This, in turn, leads to the question ‘What are the main factors influencing technical decisions?’ Our survey shows that proponents being present at meetings, and thus being in a position to discuss and defend their ideas - is the strongest single contributor to success, followed by the technical quality of a proposal (something of a pleasant surprise), and company or national interests backing a proposal. A typical comment by an ISO committee member:

“Physical presence at the meeting is a very important factor. A technically sound proposal can be rejected if no one of the experts attending a meeting supports it. Company interests also play an important role. In the case of conflicts, it may be necessary to take “diplomatic” decisions, which may lead to technically poor solutions.”

Considerably less important, though still influential, are the respective merits of supporters and opponents, and the fact that a pilot implementation is already available somewhere. It should be noted that ‘merit of supporter’ and ‘company interests’ seem to be far more important for ITU than they are for ISO.

C. The Respondents

It seems that there is a caste of ‘standards professionals’; the vast majority of respondents have been active in the field for at least seven years in various positions, and some considerably longer. About 60% of the interviewees came from the service provider/vendor side, with about 20% government and some from research institutions and consultancies. In particular, no representative from corporate users was among the respondents.

Given these affiliations it is little wonder that a majority of the respondents see themselves as ‘company representatives’ at the national level, and ‘national representatives’ at the international level; in fact, of those who see themselves in only one role, ‘company representatives’ is the one most commonly mentioned.

“By definition when I attend an international meeting, I am a national representative. When I attend a national meeting, I am representing my company. In all cases, one attempts to promote the technical superior solution; however, in the political climate of 1978 - 1995 that has seldom counted for much.” (ISO committee member, 1995).

However, some state that they also take the part of a ‘user representative’.

“End user representative seeking non-proprietary solutions.” (ITU committee member, 1996).

D. Their Views

We summarize here the (personal) views and opinions of the respondents on various aspects of the standards setting process as perceived by them.

1) *The Process in General*: Opinions concerning the standardisation process were split between two quite opposite views. The majority of respondents, however, used terms like ‘cumbersome’ and ‘over politicised’, and hinted at formality, lengthy administrative procedures, participation of unqualified people, and vulnerability to national agendas. Committee members put it this way:

“Cumbersome, slow, redundant, infested with politics and backbiting.”

“Until very recently, it [ITU] has been a strongly reactionary force in standardisation. Both ISO and ITU have a rather parochial view of themselves and are fairly out of touch with reality. Recently, ITU

has shown a greater inclination of getting in touch with reality, but has a very long way to go."

"They start with very technical issues with a lot of input from various sources such as carriers, VANs, manufacturers and so on. But they normally get very political when implementation and marketing starts."

The other group stressed the point that decisions are based on consensus, the fact that this lengthy procedure reduces the risk of faulty specifications, and the fairness and openness of the process.

"Formal processes that produce high quality standards documents which represent a high degree of consensus among the National Body participants." (ISO committee member, 1995).

There was wide agreement about the inherent fairness of the process being at the same time its major weakness.

"Its major strength -- its inherent fairness -- is also its major weakness. To insure fairness, ISO/ITU imposes formality and process. But formality and process impose overhead. The amount of process makes things slow." (ISO committee member, 1995).

2) *User Participation:* The idea of increased user participation has many advocates amongst the respondents, yet is far from being uncontroversial. There are concerns that more people would mean more overheads, and maybe even a dilution of expertise available to the committees.

"...Users have less idea about what a clean design is or could be than the vendors or PTTs." (ITU committee member, 1996).

"In general, it would not be useful to have users attend standards committees, because users are not knowledgeable about "engineering" solutions." (ITU committee member, 1996).

Moreover, respondents were afraid of hidden agendas, and were clear that user representatives would need a mandate.

"I'm not sure. The pro would be that we would have real data to work from, rather than our expert opinions, thus (potentially) increasing acceptance. The cons are significant: What qualifies a user? EVERYONE has some agenda. How do you keep other organizations (vendors, manufacturers) from influencing user groups (or even creating their own)." (ISO committee member, 1995).

In any case, most respondents agreed that help through generating and reviewing 'real-world' requirements would be useful.

"I personally think it is very valuable (having participated in user requirement standards working groups). Standards processes need continual input on what is needed in the marketplace; user input could help provide that information." (ISO committee member, 1995).

"Yes, I think user participation is an important factor in the development and especially in the maintenance of a standard." (ISO committee member, 1995).

3) *Improving the Process:* Our respondents came up with suggestions how to establish a more efficient standardisation process, each of which had a number of supporters:

- Streamline the process

The current process is widely perceived as being too slow and not able to react adequately in a fast moving environment such as information technology. Several suggestions have been made to improve this situation, including better use of electronic communication media, removing fixed schedules to work to, pay editors for their work, introduce reviewing committees. This is largely the way some regional bodies (as e.g. the European Telecommunication Standards Institute, ETSI) are working.

"Increased speed of publication; rationalisation of ISO and ITU overlap; review translation policy." (ITU committee member, 1996).

- Make documents available free of charge

At present, obtaining standards documents is a major investment. As the success of the Internet is not least attributed to the fact that its standards are freely available electronically to everyone, a similar move has been suggested for both ITU and ISO, though this would not be without problems.

"Reduce the cost of standards, at the limit distributing them "freely" on the Internet (WWW or FTP). This is a great debate these days. ISO sees a revenue problem associated with copyright violation." (ISO committee member, 1995).

- Practice what you preach

Respondents were in agreement that the standardisation process would benefit from more and better use of available technology. For instance, hundreds and hundreds

of pages are still being produced, photocopied and distributed via mail (not e-mail) at each meeting. Surprisingly, although these committees are producing telecommunications standards, use of e-mail is the exception rather than the norm, and even where committee distribution lists exist they are not necessarily used for technical discussions between meetings. It does not really come as a surprise that committee members would love to have electronic means at hand for discussion and distribution of documents. Some respondents also suggested that electronic discussions would help to broaden participation.

“Better use of Internet, web pages, ftp sites, electronic mail, on-line discussion groups, and perhaps even video-teleconferencing. Less use of paper..... So what if someone can't make three meetings a year...? Does that mean that they should be denied a voice in the standards process? That's what happens now, but it's hardly right....” (ISO committee member, 1995).

- Bring in more interested parties
The most interesting suggestion, made by several members from both ISO and ITU despite the widespread ambivalence concerning user participation. In fact, it appears that despite reservations, the need for a broader range of participants is widely recognised.

“One can only wish for representative participation - that is down to companies to enable people to participate. Perhaps better public relations with companies so that companies recognize the benefits of targeted participation in relevant standards groups.” (ITU committee member, 1996).

“More time to work, less for talking about it. Qualification of experts. Each group needs subject matter experts and standards experts, and potentially user advocates; NOT just people who have the time to attend. Also, each's expertise needs to be respected at the appropriate times.” (ISO committee member, 1995).

V. THE USERS' VIEW

A. Participation in Standards Setting

Overall, the major finding from user interviews was that corporate users, even larger ones with a very favourable attitude towards e-mail, showed little interest in addressing perceived service inadequacies by seeking to influence standards setting. Interviewees typically commented that their companies do not see any business benefits in such activities

and are therefore not prepared to spend considerable amounts of money on people travelling to meetings and working on standards committees, which brings the additional costs of people being away from their jobs. Where representatives of corporate users did participate, this appears to be largely based on *“personal initiative plus a supportive director.”* (corporate user representative, 1995).

Instead, we found that they look to service providers and vendors to come up with solutions to such problems.

“We do talk to our vendors quite a bit, if you like, they're proxies for us.... They probably sit on the committees..... They can say their customers are asking for this... You hope vendors and service providers do actually listen to their customers.” (user representative, 1995).

Given the perception of costly, cumbersome and time consuming 'official' standardisation processes (i.e. those embraced by ISO and ITU), which bring no guarantee of success, this may not be surprising. Moreover, once a problem has been identified, it will definitely be too late to try and solve it through establishing a new, or modifying an existing standard (a process which typically takes years).

Corporate users' strategy for dealing with inadequate or inappropriate functionality in e-mail standards is to circumvent them by applying their own (or those of their service providers) local fixes. This strategy was followed very successfully by at least one of the corporate users in the study. The words of an interviewee provide an effective summary of the corporate view:

“I don't think we have any issues. If we did have an issue, we would probably fix the problem ourselves, as we have done with confirmations on the Internet.”

Outsourcing of IT services is another factor which tends to deflect user companies from participation in standards setting. With its IT services being outsourced, a major petrochemical company in our study takes the view that it is outsourcing companies' responsibility to ensure that services provided meet requirements. So, if they use a mail service, they expect the outside world to be able and prepared to interconnect to this service in an acceptable way. In other words, if the service works satisfactorily, that's fine, regardless of whether or not the service is standards-compliant.

B. Perceived Quality of the X.400 Standard

A group of representatives from large, globally operating companies were questioned about observed functional

shortcomings of the X.400 standard. We had hoped that the outcome of the study would help us get a better understanding of the flaws suspected to be inherent to the standards setting process. At first glance, however, the results came as a surprise:

Identified shortcomings cover a broad range of issues, including many beyond pure service functionality, and thus beyond the scope of a standards document. In fact, the majority of the requirements are more related to organisational, policy or implementation issues rather than technical problems. Moreover, most of the technical requirements are actually being met by the functionality specified in the X.400 documents; difficulties largely stem from inadequate implementations rather than inadequate standards. At the end of the day, we were left with only one major requirement not being met by the specifications [1].

C. The Pattern of E-Mail Development

The explanation for corporate user indifference to participation in standards setting may lie in current perceptions of e-mail. The prevailing view was that e-mail at present is little more than a convenient new communications medium. In general, the corporate users in our study showed little appreciation of its strategic potential. In particular, few reported that it is employed as part of any business-critical process -- indeed, interviewees revealed that sending business-related information via e-mail is often actively discouraged.

The lack of long-term strategic planning has been a feature of corporate e-mail development throughout its history. In most of our case study organisations, initial take up and diffusion has been end-user led [4]. From a technical stand point, therefore, most have been preoccupied with the very down-to-earth issues that have arisen from a haphazard and uncoordinated pattern of development -- such as providing reasonably smooth interworking between different legacy systems -- as opposed to anticipating future requirements.

Overall, US organisations are more active in standardisation bodies. Given that, in terms of corporate e-mail usage, the US is a couple of years ahead of Europe, we may expect to observe a similar development in Europe in about three to five years time; more data will be needed to substantiate this prediction. As a result, such a development might also trigger greater interest in participation in standards setting, as awareness of the dangers of functional shortcomings in strategic services becomes greater.

VI. CONCLUDING REMARKS

Standardisation is not a simple technical activity but is influenced by political, economic and social factors. With the search for standards that are international, and increasingly comprehensive, standards setting must cater for an ever increasing range of players. Thus, it is little wonder that the formal processes of ISO and ITU tend to be frustratingly slow, and apparently, sometimes highly ineffective. It is little wonder that the dominant perception of users is that they are costly, cumbersome and time consuming and bring no guarantee of success.

Long term planning of e-mail service development is new and reflects the fact that corporate use of electronic messaging has not yet become strategic. Therefore, little additional functionality has been needed so far. In the early stages of a new technology's penetration, users' understanding of their requirements is inevitably limited and so their capacity to contribute to defining standards may be limited at this time. This situation typically changes as user experience of the technology grows, and we would expect this pattern to be repeated in the case of e-mail.

The problems corporate users have identified so far appear to stem largely from inadequate implementations of standards rather than flaws in them. For solutions to these kinds of problem, they naturally turn to system vendors and service providers rather than to standardisation bodies. It is clear that, at least for the day-to-day problems users have had to deal with so far, talking to vendors and service providers is the more practical approach, especially as these problems normally require quick solutions, rather than lengthy strategic planning.

Nevertheless, both ISO and ITU have attempted to promote greater user participation in standards setting. However, our study indicates that this has not been a success. Standards setting, especially within communications services, continues to be largely technology driven and supplier or vendor led. As such, the services offered tend to reflect suppliers' and/or vendors' priorities (e.g. manageability) rather than user friendliness and usability. It would seem that the influence of communication service users is limited to the marketplace, where the choices may already be restricted [3].

This impression of a virtually non-existent influence of users on the standards setting process, at least at Work Group level, is backed not only by sheer numbers - there were no users among the senior committee members interviewed and a negligible number among 'normal' committee members. Moreover, greater user participation would not necessarily be

happily welcomed without reservation by all committee members - a finding in some contrast with official statements from all international standardisation bodies (see eg [11])

Whilst there is some agreement amongst standards committee members that greater user participation would have beneficial effects, there is also considerable reluctance to press it further. This is understandable, if user participation is pursued within current standards setting procedures and frameworks; an already cumbersome and often ineffective process would become even more so. Furthermore, the standards professionals primary concern with 'producing a clean design' contrasts with that of users who are more interested in specifying a service that meets their needs. Against this background, it is not really surprising that even large user companies apparently are very reluctant to become actively involved in standardisation.

It is beyond the scope of this present paper to judge whether corporate user participation in standards setting is necessary (or even sufficient) to guarantee their requirements are met, either now or in the future as communications services take on an increasingly strategic role and significance; reliance upon vendors and service suppliers to act as user 'proxies' may continue to produce adequate results. Yet, amongst standards professionals themselves there is evident disquiet about the lack of user participation. Underlying this, perhaps is a concern that standards setting should be seen to be fair, and we would argue that this, in itself, is sufficient reason to prompt consideration of how user participation might be increased.

In his study of standards setting in digital wireless telephony, Hawkins observes that though costs of participation are usually cited as the principal barrier, these are often symptomatic of more fundamental problems which reflect the diverse and fragmentary nature of the user community and their problems of establishing a common view, and that this is in sharp contrast with the generally more overlapping interests and common focus of vendors and service providers [3]. Even where users seek representation through user groups (e.g. EEMA), the determination, authorisation and presentation of a user position remains problematic.

One possible solution to these structural impediments to user participation would be to provide new 'lightweight' forms of participation in standards setting processes which reduce the overheads and allow both individual and collective views to put over more easily. Within the past five years, numerous e-mail distribution services and bulletin boards, as well as publishing services (e.g. ftp and the World Wide Web) have sprung up on the Internet. We suggest -- in line with the views of many standards professionals -- that standards

organisations should look urgently at how the exchange of views and dissemination of information enabled by these services could open up standards decision-making and help to counterbalance the continuing dominance of market shares over broader conceptions of expertise.

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