The Barbour Report 2002

Exploring the Web as an Information Tool

a practical guide for building product manufacturers

Barbour Index

Barbour Index Ltd

Barbour Index is the leading UK supplier of specialist information services to construction professionals, facilities managers and those responsible for health and safety at work. The company's services are available via a range of media including web, CD-ROM and hard copy.

For more than forty years, Barbour has connected building product manufacturers with key buyers and specifiers. Services such as the Building Product Compendium, the Enquiry Service and Building Product Expert put manufacturers in touch with product decision-makers, providing suppliers with excellent opportunities for generating new business.

Barbour has utilised the latest technology to create seamless links between its services, forming an integrated set of working tools that give users fast and easy access to the technical and product information they require. As an example, Construction Expert and Building Product Expert offer an integrated service available at the user's desktop, developed specifically to meet the needs of design professionals.

Barbour Index has a long-term commitment to meeting its customers' changing information needs and delivering information in the formats that customers demand. To meet this commitment, the company has an ongoing programme aimed at improving existing services and developing new ones. Over the last three years, there has been increased investment in the development of market-leading electronic services across the range of markets that Barbour serves.

Lychgate Projects Ltd

Lychgate is a market research, marketing consultancy and lead generation company, specialising in the construction market. The company has an excellent knowledge and understanding of the dynamics of the industry, applying this expertise to tailored studies designed to meet clients' specific information requirements. Studies include customer satisfaction monitoring, image assessment, market share measurement, new product research, market profiling and brand awareness.

Interviews are regularly carried out across the full breadth of the construction industry, from design professionals to main Contractors, sub Contractors, developers and end users, including major repeat buyers of construction projects. The company's field force of interviewers is highly experienced in the challenges of identifying and questioning decision-makers within business environments.

Price: £495

Contents

Foreword

Michael G Ankers, Chief Executive, Construction Products Association

Sir John Egan's report 'Rethinking Construction' urged the industry to adopt a more collaborative approach to construction procurement. The importance of greater collaboration has been reinforced in the consultation document 'Accelerating Change', published by the Strategic Forum for Construction in April 2002. This consultation document explores ways in which the messages of Rethinking Construction can be taken forward more widely in the industry, and focuses crucially on the role that integrated supply teams and supply chains have to play in this.

It is clear that the web has a crucial role in facilitating this integration, and manufacturers have invested a great deal in their websites in the hope that they will reap future rewards. However, the 2001 Barbour Report showed that while specifiers' access to the web is now almost universal, use is still very low and manufacturers are not seeing the return they would like on their substantial investment. This points to a mismatch between specifiers' needs and manufacturers' perceptions of those needs, with electronic supply chain integration still some way from fruition.

The 2002 Barbour Report provides manufacturers with an insight into the practical steps they need to take to improve the information they deliver online. Manufacturers are aware of the potential of the web, but are not always clear what will provide an improved return. The Report looks at what specifiers want from the web and why they are not using it, and provides a clear vision of what a website should include or leave out to make it more effective.

The results show that the web does indeed have plenty of unlocked potential, and there are improvements manufacturers can make reasonably easily to the navigation and content of their websites to greatly increase their use. The Report also indicates areas that do not currently need to be developed, saving manufacturers further time and money.

In summary, this Report lays the foundations for future web development, helping the industry to achieve the supply chain integration that is at the very heart of Rethinking Construction, and to take full advantage of what the web has to offer all in the industry.

construction products association

1. Introduction

Ian Burrows, Commercial Director, Barbour Index

Over the past ten years, we have been conducting the annual Barbour Report research across a broad spectrum of industry subjects.

The focus of each year's study is driven by the implicit requirement of manufacturers to better understand current specifier needs, and importantly provide guidance on how to deliver their diverse information requirements more effectively for the future.

The focus of this year's Report has been to better understand the transition by specifiers to web-based product information. We have investigated the perceived advantages of electronic delivery over traditional media such as manufacturer literature, product directories and trade journals, the major limitations on adoption and finally a detailed study of current web offerings and specifiers' opinions.

The Report concludes that thus far the World Wide Web has failed to gain ascendancy in delivering specifiers' information requirements. Hard copy information sources remain the most popular choice for the majority of UK Architects, Contractors and Engineers.

The 2002 Report provides practical advice to building product manufacturers on how to maximise the commercial benefit of their online investment. Critically the Report highlights that while the web is not currently the first destination for the majority of UK specifiers, a failure to understand and deliver their basic needs of usability and comprehensive technical information conveys a poor perception.

The message for manufacturers is clear; the web is only a starting point in an ongoing dialogue with specifiers. The basic principles of clarity and detailed product and technical information are as important electronically as they have always been in hard copy.

While the web is unlikely to secure business in it's own right, failure to satisfy specifiers needs online can seriously damage your business.

Barbour Index

2. Executive summary

UK building product manufacturers have invested significant sums in developing electronic sources to promote their products to their target audience. To date, this investment has largely failed to deliver the anticipated return. The 2002 Barbour Report seeks to provide manufacturers with a greater understanding of how the web can be better utilised to satisfy their customers' requirements profitably.

The 2002 Barbour Report has been compiled drawing on results from a number of research studies carried out over the last 18 months. The total sample size for this year's Report is in excess of 5,000 specifiers – the largest sample of its type in the industry.

Access to the Internet is reaching saturation, with 87% of UK specifiers having access to the web. Despite this, only half use the Internet on a weekly basis to source product information.

Furthermore, only 6% currently view manufacturers' websites as their principle source of product information. Hard copy formats, such as directories and literature, are still the first port of call for three-quarters of professionals. More positively, 87% anticipate their use of the web as a source of building product information to increase.

What are the current obstacles limiting the growth of Internet usage?
Historical deterrents, such as speed of access and download, have significantly reduced, with nearly 70% of specifiers having access to the web via a high-speed connection. In addition, the use of CD-ROM is declining, and the majority of professionals now perceive the Internet as a more up to date source of information than their traditional libraries.

The principle barrier lies in the fact that specifiers, once on line, are not receiving the depth or breadth of information they require. Our research highlights that only 15% of manufacturers' sites are currently considered to be delivering on specifier requirements. Over half are seen to be average or poor. Critically, users will spend less than 3 minutes exploring a manufacturer's site, and a 'poor' electronic experience creates a poor company and product perception.

The primary user requirements are:

- Technical and performance information.
- Effective search capability.
- Manufacturer contact details.

Manufacturers must be aware that in 90% of cases a specifier will wish to make contact following a visit to their website. This is driven by their need for more customised information such as specific project applications, product availability and pricing. Background company information and the ability to place an order online are of minimal importance.

Crucially, the areas considered by information users to be of paramount importance are those which they view to be most in need of improvement, namely technical and performance details and search facilities.

The final chapter of the Report provides practical recommendations for manufacturers on how to improve their websites. Uppermost amongst these are:

- Ease of search.
- Home page structure (including clear signposting and navigation).
- Avoidance of a registration process.
- Keeping the site up to date.
- Access downloadable diagrams.
- Specification clauses.
- Detailed product application information via case studies and projects.

In essence, users are looking for solutions not just information.

3. Research sources

This Report has been compiled using a number of different research approaches, to provide an in-depth understanding of how websites are used and the requirements of product decision-makers.

Focus groups

A manufacturer consultation group provided guidance on the subject of this year's Report. Two user focus groups were subsequently held to explore the subject of how specifiers and others use the Internet for product and technical information. In total, 21 people attended the user groups, a mix of Architects, Engineers and Contractors. The results shaped the main research programme and the questionnaire.

In-depth telephone interview programme with Internet users

The use of the Internet and manufacturers' websites was explored in-depth in a telephone programme of 150 interviews with a mix of professions. Interviews averaged over 20 minutes each, and were conducted only with people identified as using the Internet to access manufacturers' websites at least once a month. A further 90 people were contacted but not interviewed as they failed to meet this criteria. This suggests that, amongst our target sample, 63% refer to manufacturers' websites at least once a month.

Results taken from the telephone interview programme are therefore representative of Internet users, and not necessarily the entire market.

The interview programme was structured to reflect the mix of professions involved in making or influencing product decisions. Participants included top 100 design and multi-disciplinary practices, medium and small Architectural practices, Structural and Building Services Engineers, Building Surveyors and large and medium Management Contracting companies.

The Barbour Report telephone interview programme

By profession	Number of interviews	%
Architects – top 100 practices	20	13%
Architects – small and medium	36	24%
Structural Engineers	14	9%
Building Services Engineers	21	14%
Building Surveyors	18	12%
Contractors – technical*	23	15%
Contractors – buyers	18	12%
Total	**150**	**100%**

*Note * Includes Contracts Managers, Architects, Design Managers*

E-survey

For the first time in the research for the Barbour Report, an electronic survey was conducted to gain quantitative reaction to specific examples of manufacturers' websites. Those participating in the telephone programme were asked to also take part in the e-survey. 57% agreed to do so, and from these 85, a 53% response rate was achieved (45 respondents). Participants were asked to review sites and to provide feedback in the form of ratings and comments.

Website workshops

To gain qualitative insight to users' views of manufacturers' sites, two workshops were held, involving a total of 15 professionals. Attendees reviewed 7-8 sites, applying the same search criteria as they would during their normal working practices. Their observations provided a major contribution to the research.

Case studies

Three face-to-face interviews were conducted within a mix of practices to provide manufacturers with an insight into the workings of individual organisations, how they apply IT, and the systems and information sources they use. One large and one medium-sized Architectural practice, and an Engineering practice have been included.

Barbour Index Building Product Compendium User Survey

With the publication of the Building Product Compendium each year, Barbour issues a questionnaire to all 22,000 recipients. These professionals cover the full spectrum of involvement in building, from Clients through to those involved in design, specification and construction. The opportunity is taken to include questions related to the topic of each year's Barbour Report.

The first 5,000 questionnaires received within a few weeks of distribution of the Compendium are independently analysed by Lychgate, providing the largest sample surveyed across the full range of professions in all major sectors of the industry each year. Selected results are included in this Report.

Building Product Compendium respondent analysis 2002

Job function	Self-fill questionnaires returned	%
Architecture	1,798	36%
Building Surveying	519	10%
Quantity Surveying	515	10%
Architectural Technology	367	7%
Civil and Structural Engineering	324	6%
Purchasing/Buying	281	6%
Project Management	271	5%
Estimating	237	5%
Construction Management	154	3%
Interior Design	143	3%
Contracts Management	134	3%
Property/Estates Management	120	2%
Building Services Engineering	97	2%
Research/Librarianship	97	2%
Facilities Management	80	2%
Administration	76	2%
Other	201	4%
Total	**5,414**	**107%**

Note: 369 respondents (7%) gave more than one profession. 5,045 questionnaires were analysed

Previous Barbour Reports

This is the tenth annual Barbour Report. The topics for this programme of research reports define specification and product information requirements, and identify trends in the construction industry. Since 1993, Barbour Index has commissioned over 4,000 in-depth interviews and has analysed some 50,000 detailed questionnaire responses from industry professionals in the preparation of these Reports. Many of the issues identified in earlier Reports remain relevant today.

The series consists of the following titles:

2001 Construction Product Information – Delivery Preferences and Trends

2000 Influencing Product Decisions

1999 The Sourcing and Exchange of Information

1998 The Building Maintenance and Refurbishment Market

1997 Electronic Delivery of Product Information

1996 Communicating with Construction Customers

1995 The Influence of Clients on Product Decisions

1994 Contractors' Influence on Product Decisions

1993 The Changing Face of Specification

4. Background: Sourcing products – the media mix

- **29% of industry professionals rank websites as a primary or secondary product information source.**
- **Only 6% rank manufacturers' sites as the most useful source of product information.**
- **15% of product sourcing time is spent referring to the Internet.**
- **87% expect to increase their use of the Internet for product information.**

The 2001 Barbour Report examined the relative use of hard copy and electronic sources of product information. The research for that Report showed that hard copy sources, both manufacturers' literature and product directories, continue to be frequently used. Websites and CD-ROMs tend to be referred to as a secondary information source, while direct contact with manufacturers is still very important to gain further information once a product has been identified.

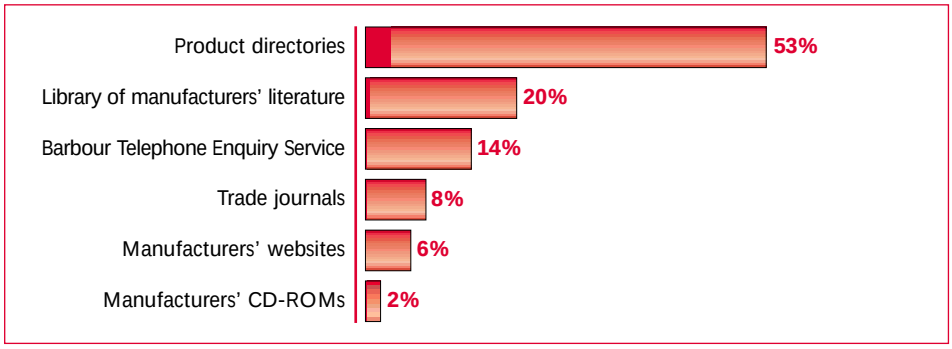
This year's Report has sought to identify why use of websites is low when access to PCs and the Internet is high. Investment by manufacturers in websites has been considerable, and understandably a return on this expenditure is required. This Report draws on the lessons and findings of this year's research to provide best practice guidelines to manufacturers on increasing the value of their sites to construction professionals.

To put the 2002 results in context, in this section we have summarised the relative use of all sources of product information.

4.1 Media ranked by usefulness

A question in the 2002 Building Product Compendium user questionnaire asked for a ranking of information tools in order of usefulness for sourcing products. 53% ranked product directories in first place, followed by manufacturers' literature. However, only 6% ranked manufacturers' websites in first place for usefulness, and a further 23% ranked these in second or third place.

Usefulness of media when sourcing products (% ranking each first)



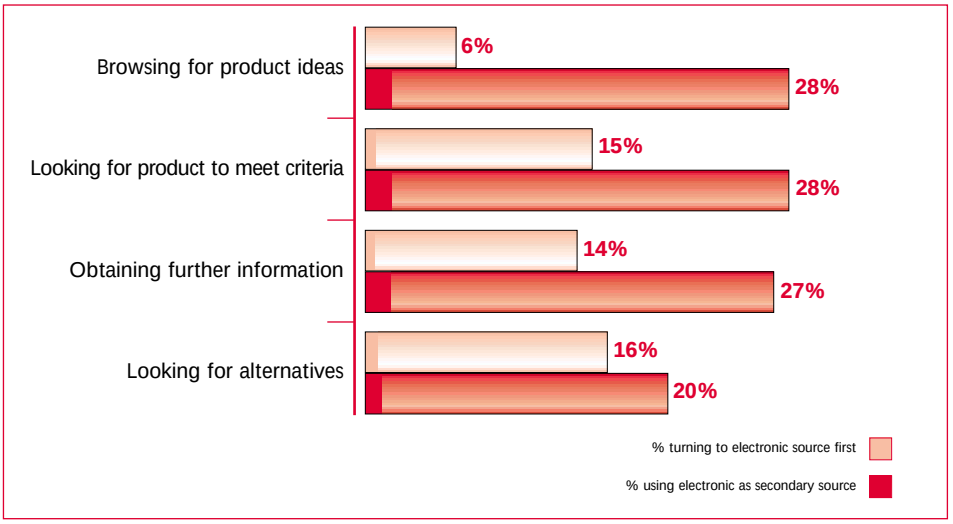
Source: Barbour Compendium User Questionnaire (Base 2002: 5,045)

4.2 Sources used under different circumstances

Specifiers may turn to product information for a number of different reasons. For example, when seeking inspiration at the design stage, when looking for products to meet specific criteria, obtaining further information once a suitable product has been identified, and when looking for alternatives to a suggested product. In the 2001 Barbour Report, a series of questions was put to respondents to identify the extent to which the various product information sources were used under each of these sets of circumstances.

The results show that manufacturers' literature, often held in the library, and product directories are the most frequently used main source of information. Comments made during the focus groups which formed part of this year's research show that this pattern is unlikely to have changed significantly since 2001. Electronic sources are used as the main source by 16% or less, although higher proportions use these sources as secondary points of reference.

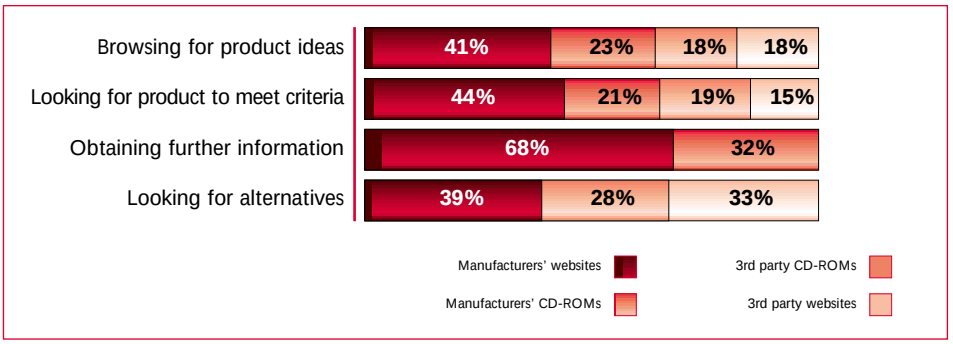
Use of electronic media for accessing product information



Source: The Barbour Report 2001 telephone programme, base 350

There are variations in the electronic delivery media used under different circumstances. In the graph which follows, both primary and secondary use of electronic media have been combined, to provide an evaluation of referral to electronic formats for product information.

Analysis of electronic source used



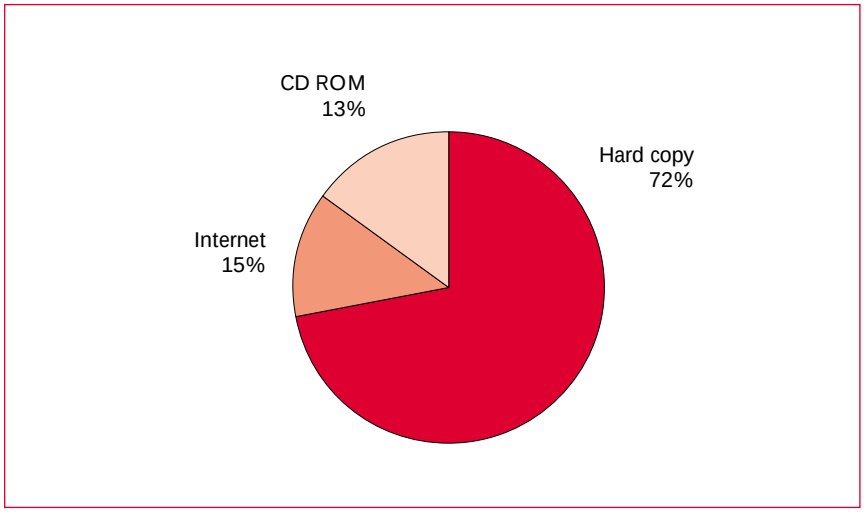
Source: The Barbour Report 2001 telephone programme, base 350

Manufacturers' websites are the most used electronic source for product information, particularly when further information is required.

4.3 Time spent using each media

To further demonstrate the use of the different media, a question was included in the telephone interview programme for the 2001 Barbour Report to identify how much time is spent using the different formats. If the time spent referring to product information sources is 100% then hard copy is used for almost three-quarters of this time, and the Internet only 15%.

Time spent using each media when referring to product information



Source: The Barbour Report 2001 telephone programme, base 350

4.4 Trends

Although there is currently a preference for hard copy, nearly nine in ten product decision-makers questioned in last year's research expected their use of websites for product information to grow over the next two years.

Anticipated change in the use of websites over next two years

Source: The Barbour Report 2001 telephone programme, base 350

4.5 Conclusions

The results in this section have demonstrated that use of manufacturers' websites as a product information reference source is currently low, however, expectations are that this will grow.

The 2002 Barbour Report examines in detail how the Internet is used for this purpose, when it is considered useful, how sites are located and, importantly, users' likes, dislikes and requirements of websites.

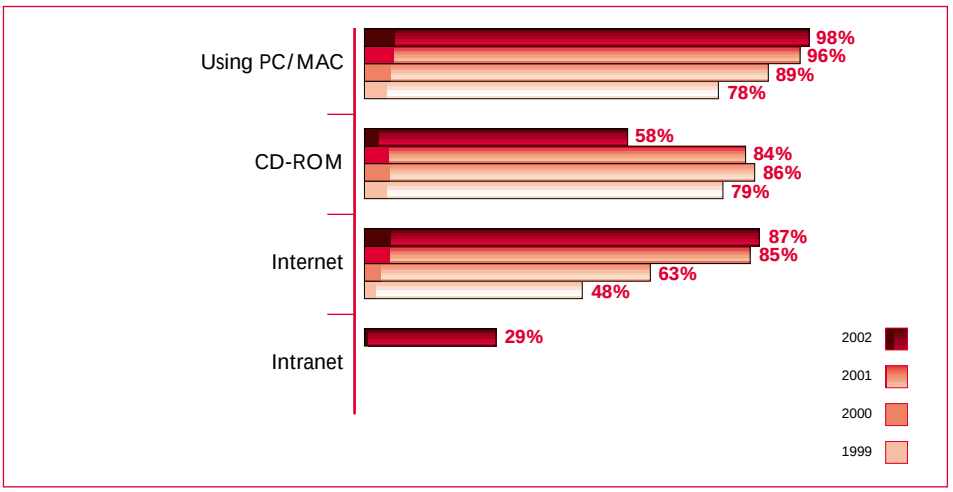
5. Policies and practices of Internet usage

- **87% of specifiers now use the Internet.**
- **81% of Internet users refer to it at least once a week for product information.**
- **The average duration per visit is about 15 minutes.**
- **Nearly 70% of specifiers connect to the Internet via a high speed link.**
- **Less than one-third of companies provide training in use of the Internet.**
- **61% use the Internet rather than the library because it is perceived to be more up to date.**
- **Use of CD-ROM is declining.**

5.1 Profile of Internet usage

The pattern of low use of electronic media for sourcing product information is set against a background where access to the Internet is now almost universal, with just under 90% of specifiers and other product influencers using it. It is also interesting to note that, based on analysis of this year's Barbour Building Product Compendium self-completion questionnaires, use of CD-ROM has fallen by nearly one-third compared with 2001, as an increasing number of professionals prefer to use the Internet.

Use of IT tools



Source: The Barbour Compendium User Questionnaire, base 2002: 5,045, 2001: 5,400, 2000: 5,095, 1999: 4,948.
Use of intranet introduced in 2002 questionnaire

Company intranets are largely restricted to the larger organisations. Of those with a company intranet, just under one in three are able to access product information through it (which equates to 8% of all product decision-makers). The main types of product information they can access are lists of approved suppliers, manufacturers' CD-ROMs and websites.

High usage of the Internet is consistent across all professions in the industry. Use of CD-ROM has fallen, and lower patterns of usage can now be seen amongst most professions.

By company size, usage rates are consistent and do not increase significantly with company size.

Use of the Internet and CD-ROM by profession

By profession 2002	Internet	CD-ROM
Administration	84%	43%
Architecture	88%	57%
Architectural Technology	87%	62%
Building Services Engineering	91%	61%
Building Surveying	84%	60%
Contracts Management	80%	47%
Construction Management	89%	59%
Civil and Structural Engineering	91%	72%
Education/Training	100%	53%
Estimating	80%	56%
Facilities Management	85%	44%
Finance	83%	67%
General Engineering	88%	50%
Interior Design	95%	53%
Project Management	88%	61%
Property/Estates Management	82%	48%
Purchasing/Buying	78%	48%
Quantity Surveying	88%	54%
Research/Librarianship	96%	64%
Surveying (Other)	100%	40%
Other	90%	58%
Total	**87%**	**58%**

Source: Barbour Compendium User Questionnaire 2002, base 5045

By number of professional/ technical staff at location 2002	Using Internet	Using CD-ROM
1	86%	52%
2-5	89%	57%
6-10	86%	58%
11-20	87%	61%
21-50	85%	59%
51-100	84%	66%
Over 100	89%	61%
Total	**87%**	**58%**

Source: Barbour Compendium User Questionnaire 2002, base 5,045

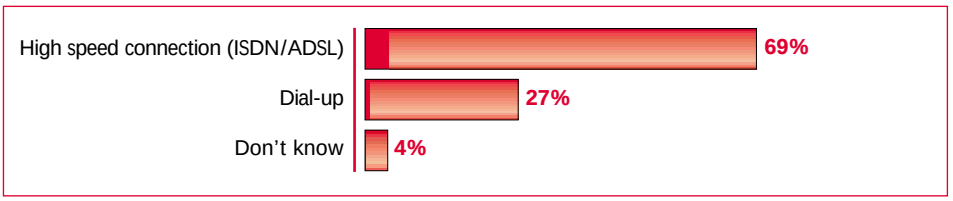
With such high usage rates, across all professions and size of company or practice, the Internet can be seen to be an effective tool for manufacturers, allowing large numbers of specifiers to be reached in this fragmented industry.

5.2 Connection types

High speed Internet connections increase the rate at which information is downloaded, and are many times faster than dial-up connections. A frequently voiced concern about websites is speed of access, and this has deterred use of the Internet. The success of telecommunications companies in introducing low cost broadband access will overcome these concerns, and encourage greater use.

The research has identified the incidence of high speed connections; over two-thirds of those participating in the telephone survey now have a high speed connection to the Internet. The extent of access via a high speed connection increases with company size; 75% of sole practitioners are still using dial-up modems, compared with only 16% of companies with over 50 professional staff. High speed Internet connections are most common amongst Building Services Engineers.

Internet connection type



Source: Telephone programme, base 150 (using the Internet at least once a month)

Connection type by profession

	High speed
All	69%
Architects	61%
Structural Engineers	71%
Building Services Engineers	86%
Building Surveyors	72%
Contractors	71%

Source: Telephone programme, base 150 (using the Internet at least once a month)

Connection type by company size

Number of professional staff at location	High speed
All	69%
Sole practitioners	25%
2-5	47%
6-10	71%
11-20	74%
21-50	71%
Over 50	84%

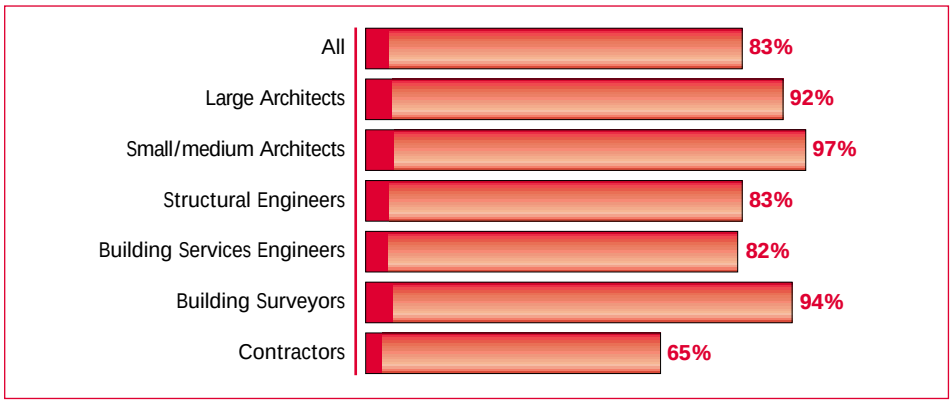
Source: Telephone programme, base 150 (using the Internet at least once a month)

5.3 Company policies

A series of questions was included in the telephone interview programme to identify company policies on staff use of the Internet, including whether any training or guidance is provided in using the Internet to source business information.

The first of these questions examined the extent to which professional staff are permitted Internet access. Results show that, on average, 83% of professional staff have access, although in Contractors, this falls to only two-thirds.

Average proportion of professional staff in practices with Internet access

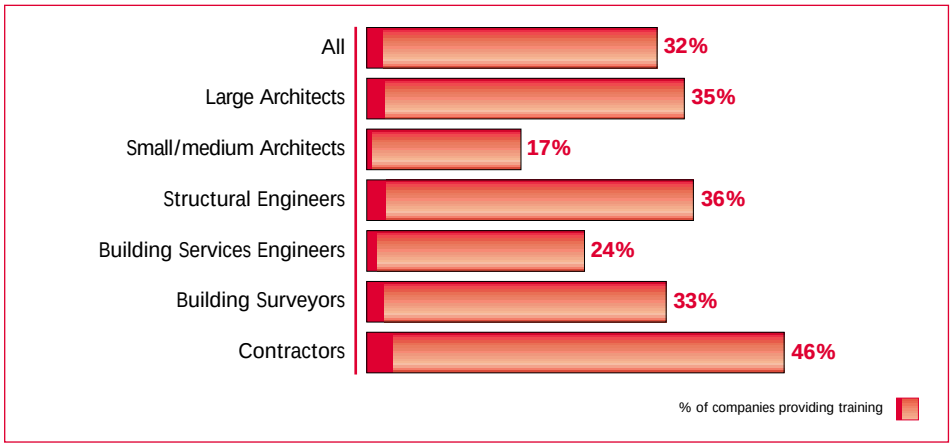


Source: Telephone programme, base 150 (using the Internet at least once a month)

Respondents representing Contractors were asked whether their company's construction sites have Internet access. 74% answered that some do, with the average proportion of sites with access being 56%. 30% of Contractors said all their sites have Internet access. Respondents stated that on construction sites the Internet is frequently used to source product information – a valuable resource when libraries and manufacturers' literature are not to hand.

Comments made during the group discussions indicated that companies do not generally give training or guidance on use of the Internet and how to access information. As a result, individuals must pass through a learning curve, and useful sources and practices may not be shared. A question was therefore included in the telephone programme to identify the extent to which training is provided. Results show that only one-third of companies give guidance on using the Internet, although large companies are more likely to train their staff; 48% of companies with over 50 staff provide training in use of the Internet.

Extent of provision by practices of training in Internet usage



Source: Telephone programme, base 150 (using the Internet at least once a month)

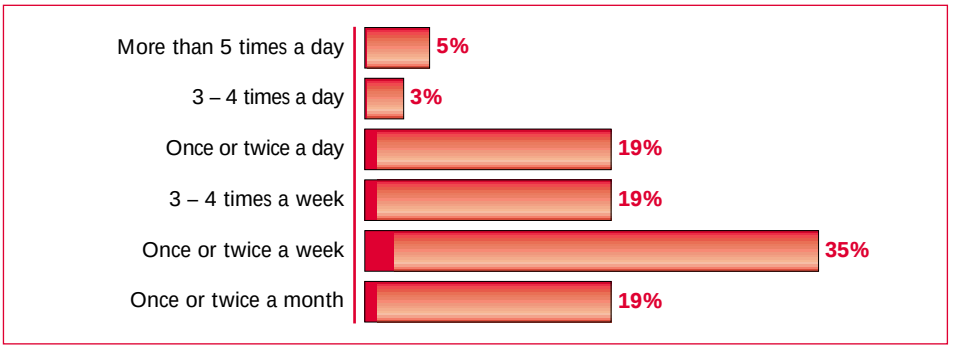
Where it is given, Internet training is usually of a general nature and in only 15% of companies does this cover the sourcing of product information, and in 13% technical information. Individuals are left to discover for themselves the best means of sourcing information. The exception to this is large organisations with intranets, where some provide links to manufacturers' sites and CD-ROMs.

5.4 Pattern of use of the Internet

Those interviewed in the telephone programme were selected because they use the Internet for product information at least once a month (63% of those contacted qualified). When questioned in more detail about the frequency with which they source product information on the Internet, 27% of those interviewed use it for this purpose at least once a day, and a further 54% at least weekly.

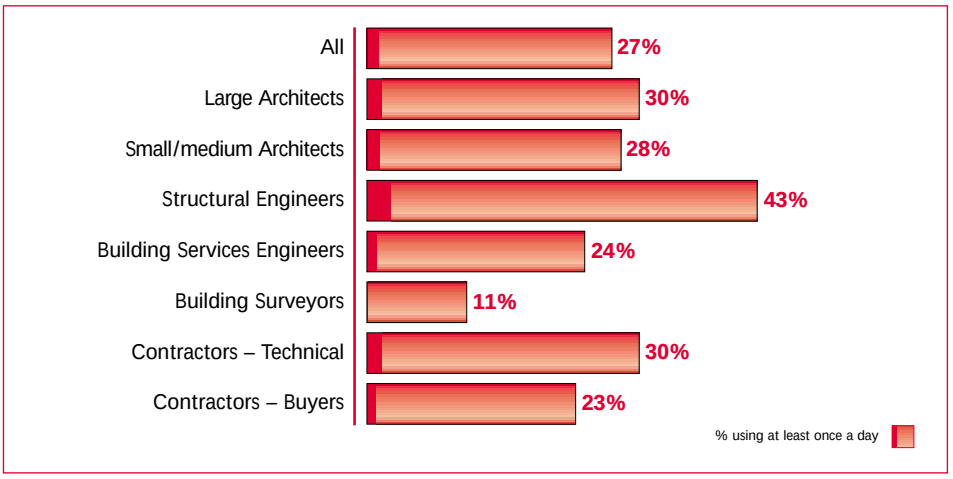
Structural Engineers use the Internet more frequently, with 43% referring to it at least once a day, and Building Surveyors least, with about 1 in 10 using it once a day or more. This shows a willingness amongst specifiers to use the Internet for product information on a regular basis.

Frequency of use of the Internet for product information



Source: Telephone programme, base 150 (using the Internet at least once a month)

Frequency of use of the Internet for product information in practices by profession

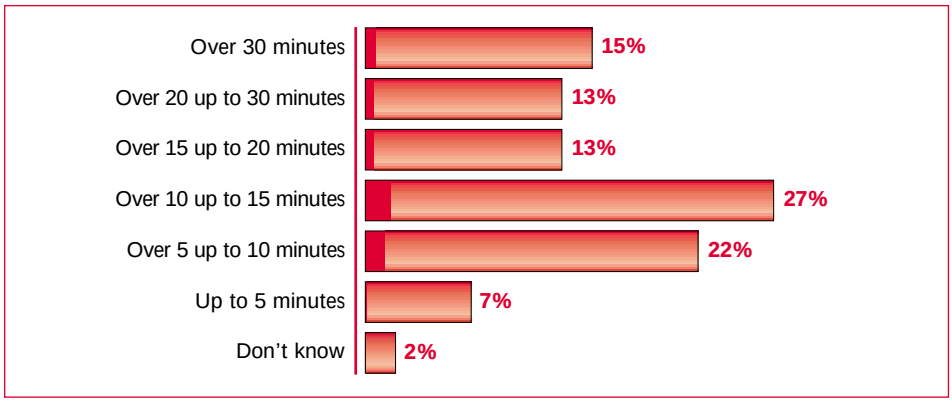


Source: Telephone programme, base 150 (using the Internet at least once a month)

The typical amount of time spent online on each occasion that the Internet is used is around 15 minutes, but there are large variations with some only spending 5 minutes and some over 30 minutes.

Structural Engineers, Building Services Engineers and Architects in large practices spend longer online than other professions on each occasion they use the Internet for product information, averaging over 20 minutes on each Internet session.

Length of time spent online when looking for product information



Source: Telephone programme, base 150 (using the Internet at least once a month)

In the last month, 55% of respondents have looked at between 6 and 15 manufacturers' sites, with the average being 11 sites. Having found a good site, 29% always bookmark it in their list of favourites and a further 27% sometimes do so. Half of the Architects in large practices always bookmark a good site, and 71% of Structural Engineers do so. In large organisations connections to manufacturers' sites considered to be useful may be provided via the company intranet.

45% of specifiers do not bookmark sites, and the reasons given by those attending the workshops was that specifiers deal with a large number of products, and it is therefore not feasible to bookmark all of them. Structural Engineers deal with a smaller number of products and are therefore more likely to record a good site. Manufacturers need to continue to ensure that their sites can be located, as even when a specifier has good experience of a site, a record may not be kept of the address. Sections 6 and 13 address this issue.

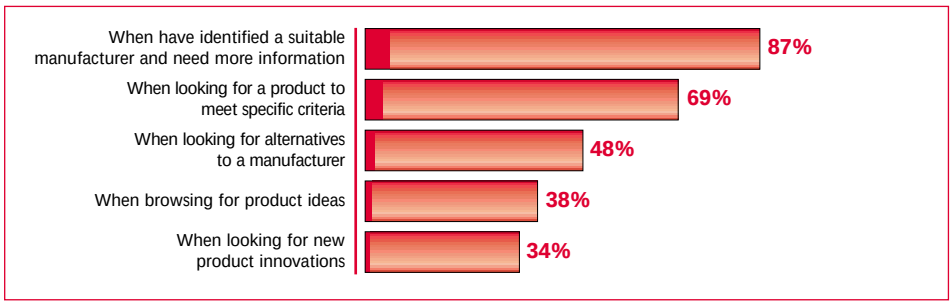
5.5 Reasons for using the Internet

Specifiers may require product information for a number of different reasons, with examples given in section 4. Differing circumstances leading to Internet use were described during the telephone interviews for this year's Barbour Report, and respondents were asked to state which describes why they use the Internet.

Almost 90% use the Internet when they have already identified a suitable manufacturer, and they need further information. However, the results of the 2001 Barbour Report showed that literature in the library and product directories are still the first port of call for identifying appropriate manufacturers. Therefore, manufacturers still need to ensure that their details are included in these conventional sources.

Additionally, the Internet is used to generate lists of manufacturers. 69% use it to identify manufacturers of products meeting their criteria, and 48% to identify alternative manufacturers.

Reasons for using the Internet for product information



Source: Telephone programme, base 150 (using the Internet at least once a month)
Adds to over 100% as more than one answer given; the Internet may be used for several purposes

There are differences by profession in the way in which the Internet is used. Those in Contracting companies are more likely than other professions to use the Internet to gain information on a manufacturer already identified. More Architects in large practices, Structural and Building Services Engineers refer to the Internet for lists of manufacturers of a given product.

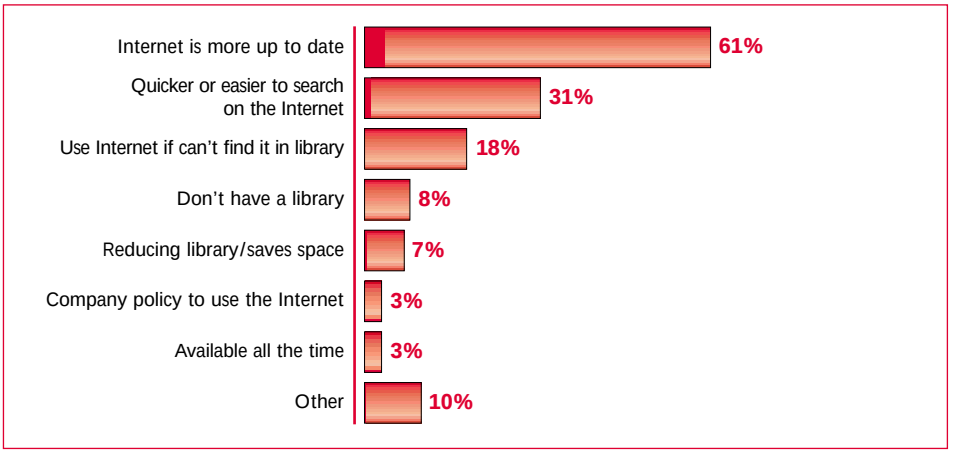
Reasons for using the Internet by profession

	Large Architects	Small/ Medium Architects	Structural Engineers	Buiding Services Engineers	Building Surveyors	Contractors – Technical	Contractors – Buyers
When have identified a suitable manufacturer and need more information	85%	83%	79%	86%	83%	100%	94%
When looking for a product to meet specific criteria	80%	58%	86%	81%	67%	52%	78%
When looking for alternatives to a manufacturer	55%	39%	43%	48%	50%	48%	61%
When browsing for product ideas	40%	33%	36%	24%	50%	30%	61%
When looking for new product innovations	50%	22%	43%	33%	28%	30%	44%

Source: Telephone programme, base 150 (using the Internet at least once a month)

In the 2001 Barbour Report, it was identified that 90% of specifiers and other product decision-makers have a hard copy library, although 4 in 10 had a policy to reduce this. What do users see as the main advantages of using the Internet rather the library? Most believe that information on websites is more up to date, a concern if in fact manufacturers do not keep their sites updated. 31% also consider it to be quicker and easier to search for information online.

Reasons for using the Internet rather than the library (unprompted)



Source: Telephone programme, base 150 (using the Internet at least once a month)

Other reasons for using the Internet rather than the library include to download drawings, and access to a greater amount of information than the library holds.

5.6 Conclusions

Whilst the Internet is not the preferred source for product information, the majority of UK specifiers have high speed web access, and are using this medium to source product and manufacturer information. The main factor driving usage is a perception that information is more up to date, however less than one-third of specifiers believe the web is easier or quicker to search than traditional media such as hard copy directories and manufacturer literature.

6. Accessing websites

- **In 61% of searches the specifier does not know the website address.**
- **Users learn of website addresses mainly through hard copy information sources.**
- **When locating sites online, general search engines are the most used tool. The most popular is Google.**
- **35% use online product directories, the best known being Barbour's Building Product Expert.**

6.1 Common methods of locating websites

The results in the previous section show that specifiers use the Internet mainly to locate a known manufacturer. The methods used to arrive at a site are consistent with this. 39% go direct to the manufacturer's site as they already know the address. 36% use a search facility to locate a manufacturer where they have the name but not the address, and 25% mainly search by keying in a product type to identify a list of manufacturers.

Manufacturers need to ensure that their site can be found via these different approaches; their products and key words must be registered with search engines, and web addresses should be promoted (see next section for information on how users learn of website addresses).

Respondents were asked to rank the steps taken to locate websites in order of importance.

Typical ways in which websites are accessed

	Most common way of using Internet % of respondents
Web address is known	39%
Manufacturer identified but web address is not known	36%
Internet used to identify a list of manufacturers of a product type	25%

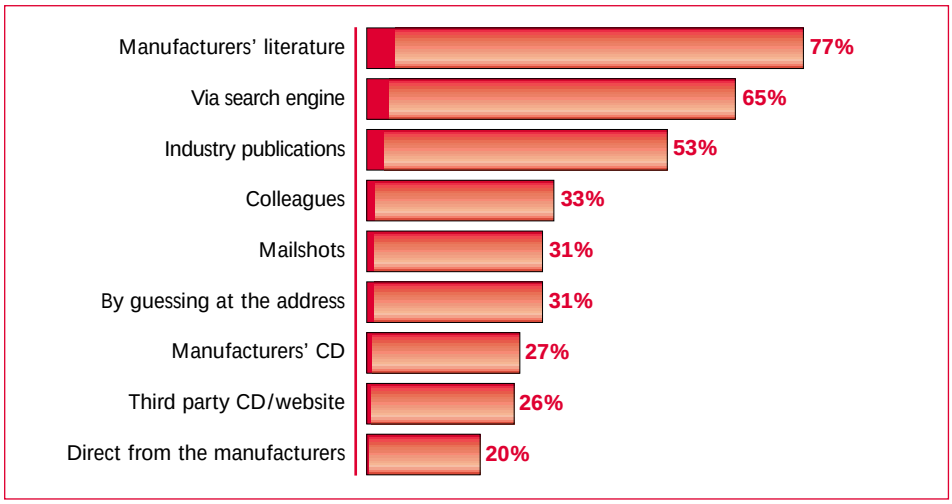
Source: Telephone programme, base 150 (using the Internet at least once a month)

6.2 How users become aware of website addresses

Many users learn of site addresses from manufacturers' literature, and industry publications, and this should be borne in mind when publishing literature or putting together promotional campaigns.

One-third may try to find a site by guessing the address; and the conclusion here is that manufacturers' site addresses should be logical. Several intuitive web addresses should therefore be established to drive traffic to a manufacturer's site.

Ways in which users learn of web addresses (prompted)

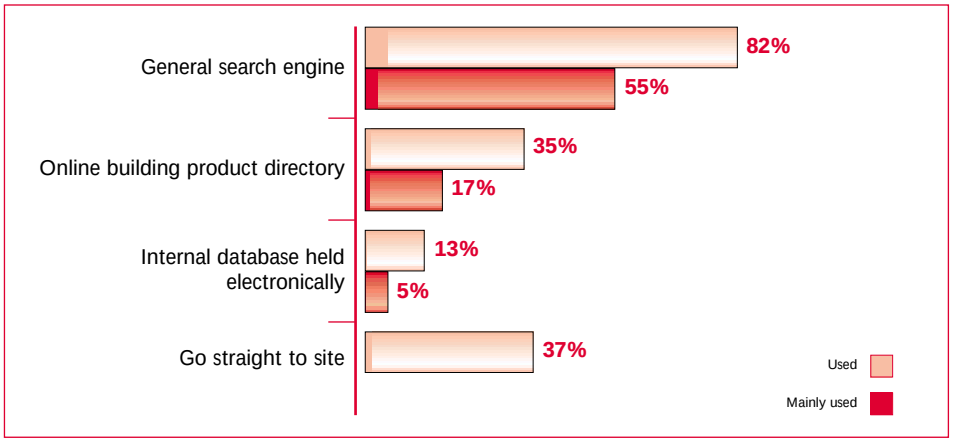


Source: Telephone programme, base 150 (using the Internet at least once a month)
Adds to over 100% as more than one answer given

6.3 Search tools

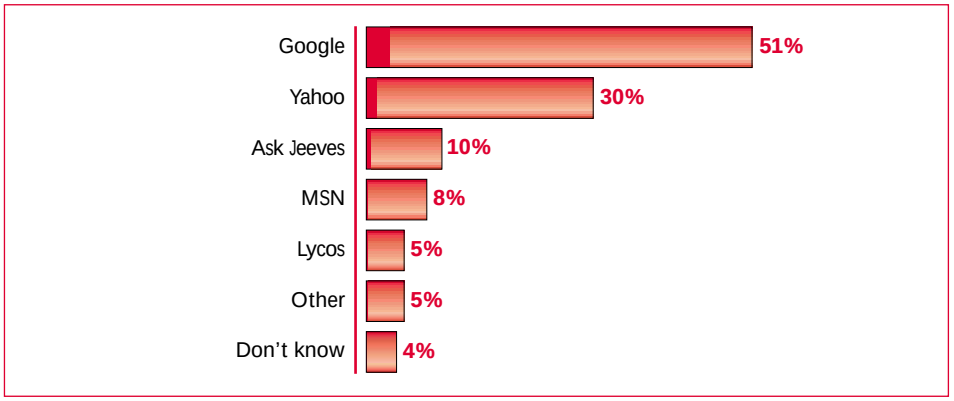
When searching for websites, general search engines are used by 82% of specifiers, with Google being the most common. Online building product directories are also used, with 35% using these as a main means of reaching manufacturers' websites.

Internet search tools used when looking for product information



Source: Telephone programme, base 150 (using the Internet at least once a month)
Adds to over 100% as more than one used

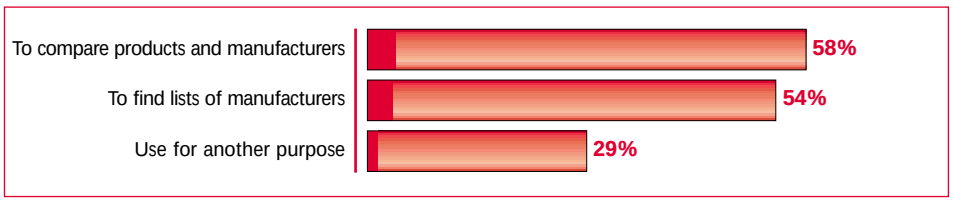
General search engines used



Source: Telephone programme, base 123 using a general search engine
Adds to over 100% as more than one used

35% use online building product directories. Awareness of these tools was investigated, and a total of 81% are aware of or use online product search tools. Barbour's Building Product Expert online tool is the best known, with 31% awareness, followed by TI's Specify It with 23% awareness. 56% of those using Building Product Expert refer to it at least once a week.

How online product directories are used



Source: Telephone programme, base 52 users of online directories

Those using online directories who stated 'another purpose' in the graph mainly use these tools to locate the details or websites of known manufacturers.

6.4 Conclusions

Awareness of specific manufacturers' web addresses is low. These are found through a variety of sources, of which the most common is hard copy. When searching online for websites, specifiers are most likely to use a general search engine. Online directories are preferred when a range of alternative manufacturers or products is required, creating opportunities for the growth of these as the primary route for specifiers to find this information.

7. Users' requirements of manufacturers' websites

- **The three most critical features of manufacturers' sites are technical performance details, search facilities and contact details.**
- **Background company information and ability to place an order online are of minimal importance.**
- **The areas most in need of improvement are technical performance details and search facilities.**

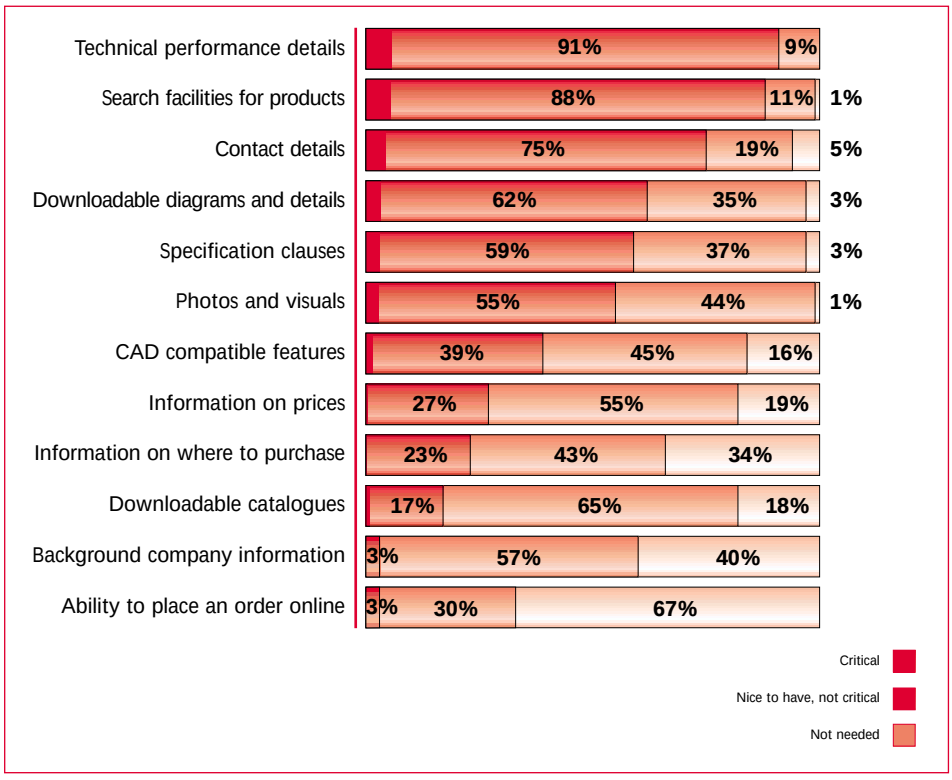
7.1 Key website features

In the 2001 Barbour Report, the features which users require of websites were identified. Key requirements included facilities to search for products, and diagrams and specification clauses which can be downloaded.
In this year's research, the opportunity was taken to examine these requirements further and to assess whether needs have changed.

In fact requirements have remained broadly the same. Features of prime importance are technical performance details, search facilities, details allowing the user to contact the manufacturer, and downloadable diagrams and specification details.

Nearly two-thirds view manufacturers' catalogues as 'nice to have'. The ability to place an order online is not required.

Importance of features



Source: Telephone programme, base 150 (using the Internet at least once a month)

As may be anticipated, there are different requirements by profession in accordance with their role in the design and construction process. CAD compatible features are of greatest interest to Architects, while downloadable diagrams are relevant to both Architects and Building Services Engineers. Although being able to place an order online is of little interest even to Buyers, this group does need to know where to purchase. Online pricing information is only considered a 'nice to have' rather than of critical importance.

Importance of features by profession
% stating feature is critical

	Large Architects	Small/ Medium Architects	Structural Engineers	Buiding Services Engineers	Building Surveyors	Contractors – Technical	Contractors – Buyers
Technical performance details	95%	89%	86%	95%	100%	78%	94%
Search facilities for products	80%	83%	93%	90%	83%	91%	100%
Contact details	70%	69%	57%	76%	83%	87%	83%
Downloadable diagrams and details	95%	56%	43%	81%	44%	52%	61%
Specification clauses	75%	67%	43%	52%	56%	61%	50%
Photos and visuals	50%	69%	36%	62%	56%	43%	50%
CAD compatible features	75%	61%	29%	19%	33%	26%	6%
Information on prices	20%	19%	21%	29%	39%	35%	28%*
Information on where to purchase	5%	14%	14%	10%	17%	35%	78%
Downloadable catalogues	20%	11%	21%	14%	11%	9%	39%
Ability to place an order online	0%	3%	0%	5%	6%	4%	6%*
Background information on company	0%	0%	7%	0%	0%	13%	0%

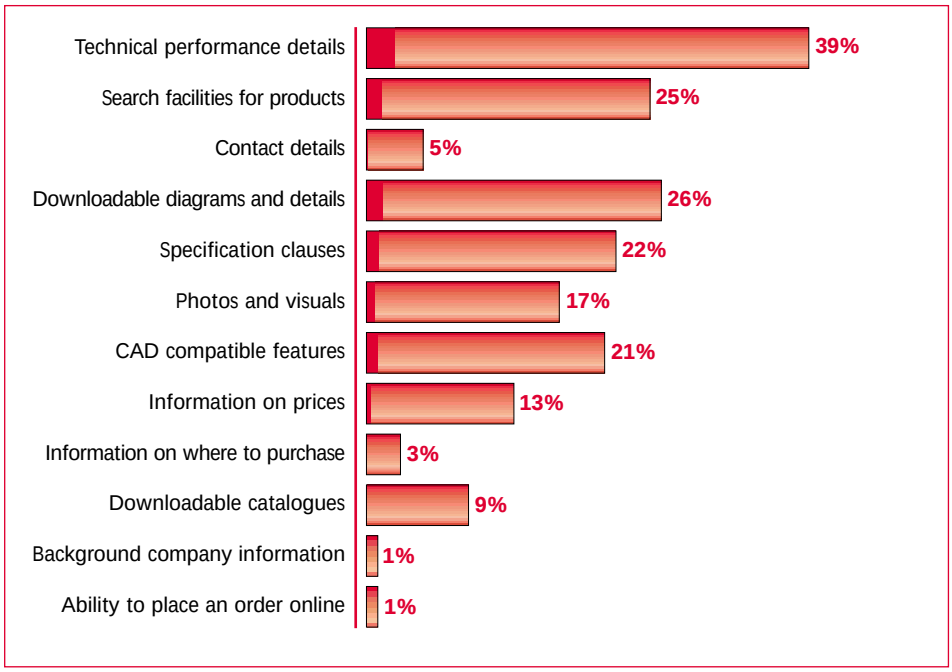
Source: Telephone programme, base 150 (using the Internet at least once a month)
Note 61% of Buyers commented that price information is nice to have and 11% said that this is not needed*
Ability to place an order online: 33% of Buyers said this is nice to have and 56% that it is not needed

7.2 Improvements required

In last year's Barbour Report, a high proportion identified that their main requirements of websites were also the features most in need of improvement. Has this situation improved as manufacturers have upgraded their sites?

With the exception of contact details, at least one-quarter of respondents in the telephone programme felt that four of the five most critical website features still require improvement, particularly the technical information available on websites (although this may be a case of not being able to find it). The graph ranks by importance those features most in need of improvement.

Features most in need of improvement on manufacturers' sites (listed in order of importance)



Source: Telephone programme, base 150 (using the Internet at least once a month)
Note: Respondents were asked to nominate three features most in need of improvement

Observation of how specifiers approach websites, made in the workshops which were used to critique manufacturers' sites, revealed that search patterns do not often match specifiers' search processes. Manufacturers have an opportunity to gain competitive advantage by designing their sites to incorporate search procedures which mimic the thought processes of their target users (see section 13, Conclusions: Website best practice guidelines for manufacturers).

Respondents in the telephone survey were asked if there were any additional suggestions or features which they would like to see on manufacturers' sites. Although some suggestions were only made by a small number of people, they are worth consideration.

Other features users would like to see on manufacturers' sites
Summary of comments (unprompted)

	% of respondents mentioning
Faster/better access to information	10%
Case studies/track record	3%
Keep simple	2%
Design software/programmes for sizing products	1%
Concise, no 'waffle'	1%
Installation details	1%
Links to related products from same manufacturer	1%
Improved image quality (scanned images poor)	1%
Geographical areas covered	1%
State whether able to supply overseas	1%
Search using key industry relevant words	1%
Future product development plans	1%
Ability to email the technical department	1%
Contact details of local reps	1%
Ability to order catalogues online	1%
Operation and maintenance instructions	1%
Uniformity across manufacturers' sites in access style	1%

Source: Telephone programme, base 150 (using the Internet at least once a month)

7.3 Conclusions

Manufacturers must include technical performance and contact details on their site. Downloadable diagrams, specification clauses, photos and visuals are also very important. Being able to find these easily is of critical importance, so specifiers ask for good search facilities and less emphasis on background company information, which may clutter a site. Worryingly for manufacturers the most critical functions of their websites are viewed by specifiers as most in need of improvement.

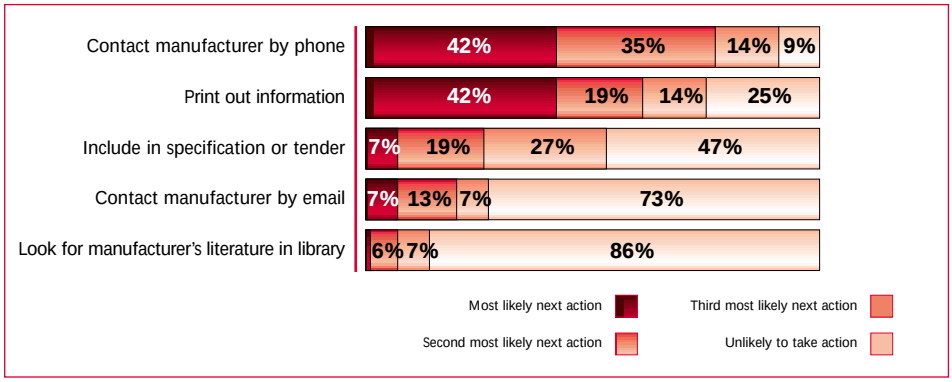
8. Next steps after referring to manufacturers' websites

- **Over 90% of regular Internet users are likely to make contact with a manufacturer by phone, having looked at their site.**
- **When making direct contact, nearly 70% are seeking additional technical information.**
- **75% are likely to print out information from a website.**

8.1 Actions taken as a result of referring to websites

Manufacturers need to be aware of the actions which users are most likely to take next, having used their sites, to ensure that they are capable of responding as needed. As found in previous studies, a high proportion use the information to make direct contact with the manufacturer by phone; 42% are likely to do this next. This demonstrates the importance of using websites to make direct contact with specifiers at the time that they are making key decisions. Frustrations with a site may cause them to move on to another manufacturer. 42% are also very likely to print out information; and this should be made easy and fast to achieve.

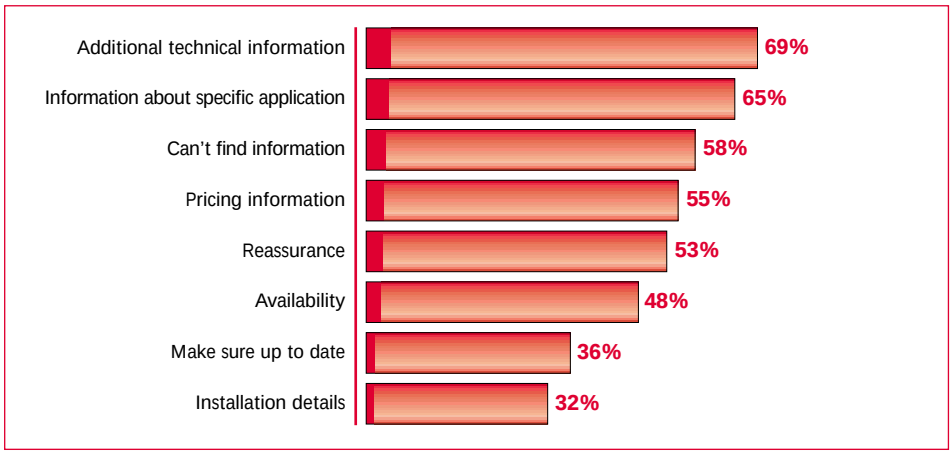
Users' most likely next action after referring to manufacturers' websites



Source: Telephone programme, base 150 (using the Internet at least once a month)

The reasons for requiring contact are given in the 2001 Barbour Report, and were reinforced in the focus groups which formed part of this year's research. Gaining further information and reassurance, particularly about using the product in the application which the user has in mind, are the main reasons for contact.

Main reasons for contact with manufacturer after referral to electronic media



Source: The 2001 Barbour Report telephone programme, base 252 using manufacturers' websites

8.2 Conclusions

Having used a website, specifiers make direct contact with manufacturers. The main drivers for this contact are a need for further more customised information regarding specific applications and projects.

9. Opinions of manufacturers' websites

- **Only 15% of manufacturers' sites are considered to be very good. Half are seen to be average or worse.**
- **Manufacturers' sites must make an impact within 3 minutes.**
- **Being unable to find usable information on sites is the main reason for lack of use.**

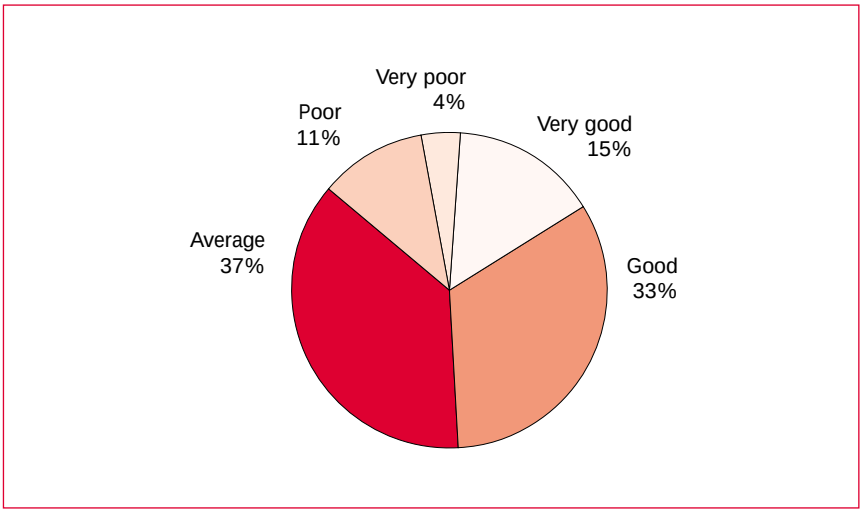
A main objective of this year's Barbour Report was the identification of common concerns with manufacturers' websites and the factors which are restricting use. Specifiers' opinions were examined using a number of research tools:

- Questions were included in the telephone programme to identify general views of the quality of information and usefulness of manufacturers' sites.
- In the Building Product Compendium self-completion questionnaire, users were asked to comment on the usefulness of manufacturers' sites in sourcing product information, and to give examples of sites which they consider to be good.
- The e-survey which formed part of the research programme for this year's Barbour Report asked participants to critique up to 6 sites and to rate the features of each one.
- Two workshops were held where a small number of manufacturers' sites were reviewed in a 'live' situation. Participants studied the sites in groups of 2-3, following which there was a discussion about their likes and dislikes.

9.1 General view

Respondents to the telephone programme were asked to give their general view of manufacturers' sites and to quantify the amount which they consider to be very good, good, average, poor and very poor. Comments made in the groups and workshops indicated that many consider that sites do not have the features they require, and appear to have been constructed by IT experts without consulting the users or attempting to understand their needs.

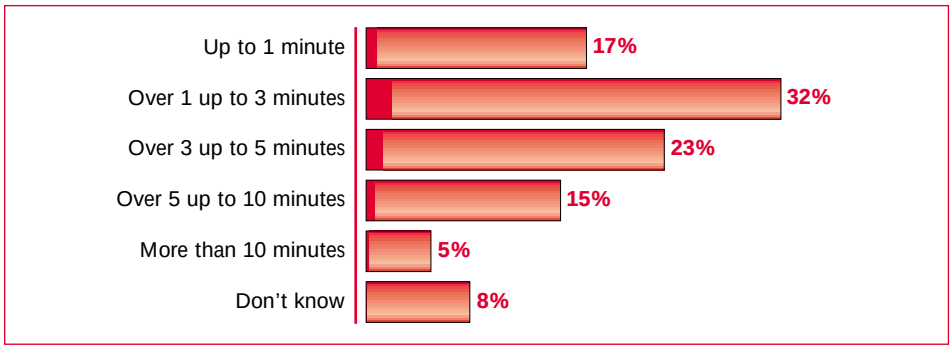
Overall rating of manufacturers' sites



Source: Telephone programme, base 150 (using the Internet at least once a month)

Experience of a poor site may cause specifiers to move on to another manufacturer. Half of our sample spend 3 minutes or less on a poor site, and only 5% are prepared to spend over 10 minutes. Manufacturers' sites must make an impact and be capable of delivering the required information within 3 minutes to minimise the chance of losing business.

Time spent on a poor site before giving up



Source: Telephone programme, base 150 (using the Internet at least once a month)

In the Building Product Compendium questionnaire, users were asked to state a manufacturer's website and CD-ROM which they rated highly. This question was also asked in last year's questionnaire. The analysis based on the first 2,000 questionnaires returned to Barbour, shows that the same names were mentioned this year. However, the most mentioned site was quoted by less than 2% of respondents, and the top CD-ROM by under 4%.

Manufacturers with highly rated websites

2001	2002
Redland	Redland
Marshalls	British Gypsum
British Gypsum	Velux
Kingspan	Kingspan
Velux	Marshalls
Ibstock	Pilkingtons
Hepworth	Armitage Shanks
Marley	Hepworth
Altro	Marley
Armitage Shanks	Rockwool

Source: Barbour Compendium User Questionnaire 2001 and 2002, base first 2,000 questionnaires analysed

9.2 Observations from workshops and focus groups

The two workshops which formed part of the research programme were attended by 15 specifiers, mainly Architects but also a small number of Structural and Consulting Engineers. These 'live review' sessions were very informative and provided an opportunity for the research team to observe how specifiers use websites. The conclusions will be of benefit to those looking to develop and improve their websites:

General

- Specifiers are not IT experts and the inference drawn is that many are on a learning curve regarding Internet usage. It must be clear how features on sites can be of benefit to them. Sites are rarely used to their full capacity because it is not clear what information is available, or how it may be applied.
- Sites held in high regard outside the construction industry include the BBC, Multimap.com, UpMyStreet.com, easyJet and British Airways, because of their ability to deliver highly useful and relevant information, quickly and intuitively.
- Many specifiers do not keep 'favourite' sites because of the wide range of products they generally use.

Key requirements

- Key criteria for good sites are considered to be the ease of finding information, the structure of the home page and ease of navigation beyond the home page.
- The required information should be capable of being reached within as few clicks as possible.
- The common view, expressed in the workshops and the focus groups held at the outset of the research programme, is that there is little requirement to have a different approach to sites according to profession. While Engineers may have a greater need for performance criteria and technical parameters, and Architects are more often concerned with visual aspects, each also has a wider need for information.

Opinions of manufacturers' sites and suggestions for improvement

- There were no strongly positive reactions to any of the sites examined. In fact there was a sense of frustration with most of them due to difficulties in finding the information they had tasked themselves with locating; typical searches which they might undertake during a working day. Only two sites of the 8 examined received positive comments for their home page and ease of use.
- Search patterns and menus do not match specifiers' search criteria. Comments were overheard such as 'My guess is I've got the wrong product', 'I found it purely by chance', and 'I would never have found that without being told'.
- Manufacturers need to identify the search criteria and approaches relevant to their product type. Users want solutions, not just product listings. One suggestion was the facility to interrogate sites, by asking 'How do I..' questions in the same way as they would ask questions of a technical department.
- Requests to register on sites are a major deterrent. None wanted to visit the site where there was a requirement to register, as there is a concern that they may be bombarded with sales approaches. Password access also deters; many do not want to have to remember yet another password.
- One site, that of a well known manufacturer, gave the initial impression that it provided downloadable information only. However, further investigation showed a greater level of detail which was hidden from the user. Clear navigation is a must for building product manufacturers' websites.
- Home pages were criticised for being too busy and overwhelming. Icons which are outside the 'comfortable cursor range' (around the centre) can be more difficult to use. Animations which do not add to the content and take time to download are a major frustration, particularly on repeat visits.
- Menus with sub-menus are not always easy to use or to retrace a path. Some menus are in fine print and it is easy to click on the wrong one.
- The content of sections should be clear.
- Approaches, menus and icons should be consistent throughout a site.
- Manufacturers may wish to consider offering suggestions and alternatives, using the intuitive approaches provided by some consumer sites.
- There was a perception that colour reproduction online is unreliable and physical samples may therefore be required.
- Users would like to be able to mark useful pages or sections so they can locate them again, in the same way as they might use Post-It notes on hard copy.
- Complete downloadable catalogues was the preference of some, however many would prefer technical data sheets which can be more easily downloaded and saved.
- Case study and project information was viewed as highly valuable, providing reassurance and establishing credibility.

Next steps

- There was general agreement in all groups that having located a website and found a certain amount of information, specifiers will normally still need to make direct contact with manufacturers for further information, literature or samples, or for reassurance that the product may be used in their application. As one person commented, 'It's important to deal with people, people have experience'. Some see websites as providing an 'introduction' to the company. Having become familiar with that company, the next time they wish to specify, they may feel more comfortable about using the tools and facilities on the site.
- The participants commented on the lack of training and advice given by manufacturers with regard to the use and functionality of their individual sites.
- Examples were given of technical departments re-directing callers to the website, but if specifiers are unable to find the information they enquired about, they are unlikely to call back.

9.3 Ratings of specific websites

Respondents in the telephone programme were asked if they would be willing to participate in an e-survey to review some manufacturers' sites. Although the comments in the groups were extremely useful, the purpose of the e-survey was to gain a view from a wider number. 45 people answered the survey, of which 38% were Architects and the rest a mix of Contractors, Building Services and Structural Engineers.

The average scores are given below, using a scale where 10 is excellent and 1 is very poor. The features which users were asked to review are shown mainly in order of importance. The two sites which are held in high regard by the highest proportion were included, British Gypsum and Redland. The identity of other sites is not disclosed as ratings were not consistently high.

As can be seen by the score given to 'overall impression of the company', the highest rated sites convey a good impression, whereas those rated poorly convey a poor image for the companies concerned.

On the British Gypsum site, it is the level of technical information, the specification clauses and the ease of contact with the company which were particularly rated highly. On the Redland site the top three features were ease of contact with the company, the search facilities and the corporate company information. Overall, both companies have succeeded in achieving a high level of satisfaction in the main features regarded as critical.

Conversely, other sites were rated particularly poorly for key features such as search facilities, level of technical information, downloadable diagrams and specification clauses and CAD compatible features. As one person commented about the Cladding site 'It does the company no favours'.

It is not surprising that, when asked to state their preferred site, three-quarters quoted either British Gypsum or Redland.

Rating of manufacturers' sites (10 is excellent and 1 is poor)

	British Gypsum	Redland	Aluminium products and structures	Roofing materials	Lighting	Cladding
Level of technical information – sufficient for your needs	7.46	6.95	6.15	5.92	5.96	4.75
Search facilities for products	7.10	7.47	5.93	5.88	6.14	5.69
Ease of contact with the manufacturer through site	7.41	7.53	7.64	7.48	6.80	6.23
Diagrams and details which can be downloaded	6.86	6.65	5.23	5.68	5.96	4.42
Usefulness of home page	6.87	6.74	7.29	5.84	6.21	5.77
Specification clauses	7.48	6.31	4.31	5.05	5.00	4.75
Visuals and graphics – sufficient for your product type	7.10	6.95	7.36	6.16	6.43	5.00
CAD compatible features	5.59	6.57	3.92	5.17	3.29	4.80
Corporate company information	6.84	7.20	6.36	5.86	5.83	5.00
Visual style of site	7.03	7.05	7.50	5.68	6.25	4.38
Ease of navigation	7.37	6.95	7.29	6.68	6.38	5.08
Printable product information – sufficient for your needs	7.24	7.11	7.00	6.18	6.36	5.25
Overall satisfaction with the website	7.53	7.47	6.79	6.44	6.29	4.61
Overall impression given of the company	7.83	7.79	7.36	6.56	6.59	4.92

Source: E-survey, base 45 answering at least part of questionnaire

9.4 Conclusions

Despite the significant investment made by manufacturers in their websites, specifier perception is still generally poor. Specifiers will invest very little time if a site fails to deliver the required information. Ease of navigation and searching are critical to the user, and a request to register is a major deterrent. It is unlikely, however, that the web will lead directly to specification. Most worrying for manufacturers is the negative perception which poor web experience conveys to the specifier.

10. Factors limiting use of the Internet

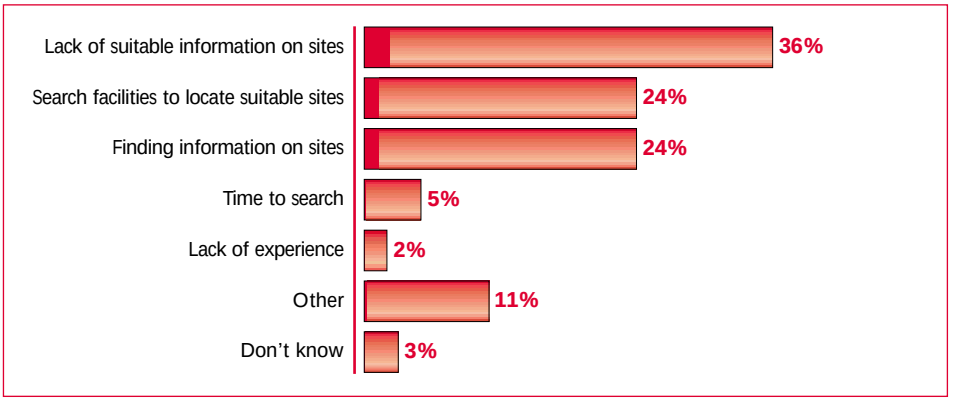
- **Complex graphics are a major deterrent for dial-up users.**
- **Lack of usable information, exaggerated by poor search facilities, is limiting greater use of the Internet.**

In previous Barbour Reports where use of the Internet has been examined, questions have been included to identify the factors preventing greater use of the Internet. Speed to access information has been a frequently expressed concern, with time taken for pictures and information to be downloaded being major issues. 42% of the respondents to the telephone programme for the 2001 Barbour Report quoted speed as the main drawback to using the Internet.

However, with over two-thirds now using high speed connections, this has become less of a concern. For the smaller practices, most of which still use dial-up connections, waiting for pictures to load is still a frustration.

For many specifiers today, it is the lack of usable information on sites which is a main problem, although this could be due to poorly constructed search facilities. Locating suitable websites is also another major problem, which one-quarter feel is restricting their use of the Internet for accessing product information.

Main factors limiting use of the Internet (prompted)



Source: Telephone programme, base 150 (using the Internet at least once a month)

Other limiting factors include cost of searching (for those with dial-up), a personal preference for using hard copies, the requirement of some sites to log in.

11. Case studies

To demonstrate how practices are using technology to source, apply and share information, a small number of face-to-face interviews were carried out with a mix of different practices. Each session lasted about three-quarters of an hour.

11.1 Case study 1: Small/medium-sized architectural practice

General use of IT

This team provides a full architectural service nationally to individual clients and developers, and is based in the South East. The practice is currently engaged in the design and detailing of large residential schemes around London.

The company has invested heavily in computer technology. Most staff have powerful workstations with up to date CAD software linked to a range of shared printers and plotters. All workstations have access via a Local Area Network (LAN) and ISDN to email and the Internet. There is a strong 'electronic' culture with almost all output being generated electronically.

There are no stated policies governing Internet usage nor has any formal training been provided. However there is strong management commitment to electronic working and staff feel empowered to develop individually and collectively in this area.

This team felt they were leading the way electronically amongst the other consultants and Client organisations they communicate with. They still encounter companies with limited email distribution and have one major Housebuilder Client who does not have any such facilities. The communication of project documentation is still mostly via hard copy; use of electronic formats is not developing as quickly as they would like. They have not experienced a project where an extranet or website has been developed for collaboration purposes. Agreement upon the electronic environment is now a primary activity of project set-up.

Technical information sources

All workstations have access to Barbour's Construction Expert. Technical information such as Building Regulations are occasionally accessed electronically but day-to-day practice still mainly involves consulting 'hard copy'. Many projects have high 'repeat' elements and an estimated 70% to 80% of technical specifications are familiar and readily to hand. Electronic tools and websites, together with hard copy, are used to source the unknown. Many Clients have detailed technical specifications that are integrated into new project data.

Requirements to keep project files for QA and health and safety purposes are typically met using hard copy records.

Product information sources

Many Clients have standard product specifications which designers are required to incorporate into projects. These are mainly paper-based having been developed across many projects over numbers of years. New product searches are frequently conducted using hard copy information. Making direct comparisons across a number of product web pages is difficult and time consuming. They can be conducted more effectively using brochures or directories. Web searching is typically conducted utilising a general search engine such as Google, hopefully leading to the desired destination. This team uses few 'industry' portals. Website information is frequently used to contact a manufacturer directly, mostly to request hard copy information or advice and technical support. Where site details are noted from journals and brochures, these are visited 'if I have time'. Some individuals keep unstructured records of useful sites but there is little address sharing.

Product sites are regarded as cluttered or sales orientated. This team felt they would only visit a site when they were problem solving; 'what performance?', 'how big?', 'will it do that?'. A quick overview and easy access to the required information is essential to match the hectic, time-constrained nature of product selection and specification. Sites that require registration/login or lengthy exploration will frequently be abandoned.

Vision for the future

Having already tried to eliminate central and personal hard copy storage once, the vision of 'paperless' operation is doubted. Despite a strong electronic culture at team level and a management committed to harness the efficiencies of electronic tools, there is frustration at the barriers to full electronic working they have encountered. With a Client base apparently not eager to adopt computer design and communication tools, they are struggling to persuade external members of the team to match their own investments. The short-term vision is to see greater adoption of electronic tools across the industry.

Unless the ability to compare or refer, quickly and easily, across a number of 'pages' can be delivered, product sites are likely to remain as secondary rather than mainstream information sources. None felt the library would be gone in the next three to five years.

This team shared the vision of design and specification captured in multi-layered, three dimensional, electronic models to which all consultants, contractors and suppliers would contribute. Whilst technology can provide this, in reality working practice is still a long way from achieving it. Although they hope to incorporate some part of this vision, possibly a web-based information depository for a project in the next three years, they felt it unlikely that they would be approaching the full interactive vision within that timescale.

11.2 Case study 2: Large planning and design company

General use of IT

This company has offices nationally and across Europe. There is a strong electronic culture throughout, with all offices and individuals linked via broadband intranet, introduced in the last three years. All staff have unrestricted access to the World Wide Web. Policies governing good email practice are issued and monitored.

The intranet is used for centralised administrative functions as well as project-based information. All internal job costing and Quality Assurance information is handled across the intranet as well as profiles of staff employed throughout this widely located organisation. Centres of excellence within various locations are sharing information through dedicated pages on issues such as Sustainability and Planning Guidance Notes.

This organisation gets involved in many large commissions and it is common practice to agree the electronic profile for the project at the outset. Several large current projects are being conducted using the AutoDesk 'Buzzsaw' suite of project collaboration tools. This has a full audit and archive facility and provides access to all consultants as well as the Client. Most drawings are issued electronically but almost always backed up with hard copy. Few Clients have the ability to read drawings electronically and some do not have well developed email resources or procedures.

Technical information sources

All design staff have access to a 'third party' technical information system through the web. However, much technical information is still held and used in hard copy. All offices still retain full hard copy libraries. Some government information sites and other specialised sites have been vetted and addresses distributed to all employees. All specification is produced using NBS Specification Writer, which is available across the intranet.

Product information sources

Most product information used across this organisation is in hard copy format. All offices have hard copy product libraries but many individuals have independent information for general and project specific purposes. All job files are kept in hard copy. Whilst most mainstream industry journals are received and distributed, product specific publications are held centrally for 'as required' reference.

Although product manufacturer websites are occasionally consulted, there is little evidence of an established 'web' culture. There is some use of CD-based product information in the design offices, particularly where information can be transferred directly into NBS or details copied into AutoCad. The primary reason given for lack of website usage was the inability to compare products within and across sites.

Vision for the future

This organisation cannot foresee the removal of its hard copy libraries within the next five years. Whilst there will be an increasing use of the Internet, it will be primarily as a centralised control and contact mechanism.

Information delivery formats and design tools must be user friendly and easy to operate to encourage adoption. The AutoCAD tools used across the organisation have various 'add-ons' which allow multi-layers of information to be assembled. These are not being used currently because of perceived complexity and internal resistance.

The expectation is for greater use of web-based project collaboration tools and greater utilisation by a wider number of parties involved in the project. Uptake to date has been disappointing but there are signs that interest and involvement in centralised electronic information is increasing.

11.3 Case study 3: Leading services and environmental engineering practice

General use of IT

This company operates from its main office in London with a satellite office in New York. It has an international reputation with many commissions in Europe and the rest of the world.

A Director is actively responsible for all IT throughout the company. He takes a 'hands-on' role in the provision of content for the company intranet. This is viewed as a core communication, information and administration tool. There is a strong commitment to having a centralised data repository.

All professional staff have powerful workstations with a comprehensive range of software. Not all engineers have CAD; in some cases this work is directed to CAD drafting specialists. Most CAD drafting is two dimensional, with 3D rarely being used here.

All workstations have access to the company intranet, and through that broadband access to the Internet. There is extensive day-to-day use of email and the Internet, and policies have been established to guide usage.

Staff still encounter Clients and Consultants across the range of disciplines who have not made the investment in IT. Some still rely on an unlinked IT infrastructure with 'dial-up' Internet access.

Technical information sources

A large amount of technical information is provided internally via the company intranet. This is regarded as the main 'day-to-day' working tool. Technical documents, standards, articles, product reviews, product literature etc. are selected by a Director and catalogued into a 'tailor made' search engine which has been developed for this company.

The company utilises NES for specification supported by Barbour's Construction Expert.

A range of project checklists, standard documents and guidance notes have been developed to encourage consistent practice and output. Links to sites such as CIBSE, BSRIA and DETR are made available to all users, as are sites that provide details of increasingly applicable European legislation.

Product information sources

International commissions in this organisation are handled by multi-national staff whose horizons in product terms stretch beyond UK manufacturers. Mechanical and electrical components and systems are regularly sourced from across Europe and support from these manufacturers is sought, via the Internet, on a regular basis.

A hard copy library is still maintained but usage is low and thought to be reducing. This is being replaced in the main by the company intranet where all employees are being encouraged to submit product literature, technical notes and reviews to be shared by all.

Energy rebates, tax advantages and other financial incentives for the installation of 'green' equipment is increasingly important and failure to check for 'approved status' prior to specification could be very costly. The Internet is used extensively to check for up to date information in this context. Manufacturers are not thought to be providing enough information in this area.

Vision for the future

The company has been involved in projects which utilised some form of project collaboration tool, but the experience to date has been unconvincing. This is seen as the future, however, with dedicated intranets being established for each project. The technology for 'active drawings' with background data already exists but is not being used because of complexity and lack of 'across the team' utilisation. This is expected to develop and gain wider acceptance in the next few years.

Some consider that 'rule of thumb' design principles are still widely used in the industry. Many of these are no longer valid and the need to 'model' and 'simulate' components and schemes at the design stage will increase.

The technology for remote monitoring and diagnostics of equipment through Building Management Systems already exists but is again slow on the uptake. Major Clients are now starting to call for digitally maintained BMS.

The capability of PDA's (Personal Digital Assistants) has improved rapidly and these will increasingly be used away from the office, say on sites for example, for note taking, communication, and drawing reference.

12. Future developments

In this section, developments in the industry are raised which will have an impact on the future delivery of product information in electronic formats. Expert opinion and advice for manufacturers is provided in papers authored by consultants to the industry and covering the topics of project extranets, 'smart' objects and e-business.

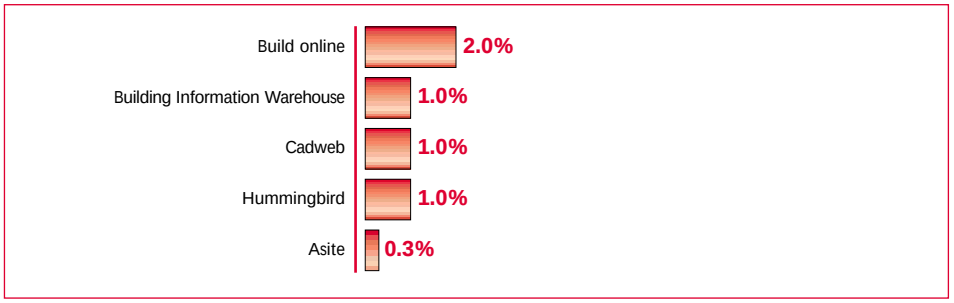
12.1 Project collaboration tools

The Internet offers tremendous opportunities for the sharing of data within companies and across project teams. The potential benefits are enormous, and include common access to comprehensive data, cost and time savings in data sharing, more accurate project records and an easier process for amending drawings and documents which minimises errors.

There are many project collaboration tools available on the market. Some of these tools are aiming to provide an information resource and product procurement facility, as well as document management, although they have not yet necessarily achieved this. By integrating product information, and links to manufacturers' sites, a comprehensive electronic library of information can in theory be provided alongside other electronically held project documents.

A question was included in this year's Building Product Compendium questionnaire to measure the extent of use of existing project collaboration tools or extranets. Results show that, on average, 2% of projects in 2001 were managed using this type of electronic facility. Use is greater amongst the larger companies, but smaller practices also have some experience.

Experience of project collaboration tools



Source: Barbour Compendium User Questionnaire 2002, base 5,045

12.2 Expert paper: Project extranet case study

By Peter Goodwin
Peter Goodwin is an independent management consultant with extensive experience in the construction sector. He is a Chartered Civil Engineer.

This paper describes how a project extranet was used to design and construct a 1,500 sq m office facility and car parking structure for 800 staff at Nortel Network's base in North London. A commentary is provided on how this new way of working might impact on the building product industry.

Project kick-off was September 1999, and first occupation was planned for October 2001. The project operated under a partnering arrangement. Team members, a number of whom had worked together previously with integrated IT systems, were:

Lead Consultant – HOK International
Project Manager and Planning Supervision – PPT-Integration
Associate Architect – Tebbot and Wells
Cost Consultant – Wicksteeds
Structural Surveyor – Price and Myers
Building Services Engineer – Cudd Bentley
Management Contractor – Willmott Dixon

The project was to run to an aggressive construction schedule of 13 months from start to occupation. Information needed to be issued quickly, allowing more time to think – rather than wasted in waiting. A central database was agreed upon at an early stage and this reduced the cost of information production. The Project Manager's involvement early in the project had a pivotal impact on the information system selection and getting buy-in from the Client for its use. This was initially based on savings in reprographic costs.

A key feature of the project was partnering, with regular workshop sessions being held from the outset to agree goals, both for individual firms and for the project as a whole. These goals and agreements were incorporated into a set of project rules, which were championed by the Project Manager.

The partnering process was regularly monitored and a culture of 'no blame' and collective responsibility was introduced. Meetings did not take place without a specific justification, and information that team meetings traditionally generate was available widely through the IT system. Email was used for confirming discussions, but not for general debate.

A central information database was established utilising Bidcom Project Net, an extranet system accessible by secure password. Contingency in the event of the system failing during the life of the project was achieved through the project team retaining their own office systems to manage their own data, with the system providers managing the shared information. If the system failed, the team could quickly revert to paper communications and continue the project with the traditional approach. Strict guarantees on service levels were also negotiated with the system providers. The cost of the system was more than covered by savings on reprographic costs across the project. The system delivered many benefits with the primary benefit being the speed with which the project team could respond to changes.

The distribution of paper documents usually takes 3 days, and often longer. With the extranet, this was completed in minutes. This gave the project team more time to consider options and talk to each other instead of having to react, helping to keep relations cordial. The consequential savings of eliminating these communication delays were considerable but have not been quantified.

Common software applications are used along with project-wide drawing, numbering and layering systems. These were agreed at the outset of the project, championed by the Project Manager. All construction information was issued in a non-editable format.

The project information management strategy was based on a hierarchy, with a 'secure' area for design development and a restricted area for procurement. Open areas covered design documents, contract instructions, meeting notes and O&M/H&S file documentation.

The project team provided feedback on the IT systems used. It was initially perceived that extranet systems were not for 'beginners', largely because of the expectation that they would be 'difficult'. However, experience had shown that users quickly became adept. The system was excellent at keeping all team members informed and for using common project data.

With servers initially located in the USA, there were difficulties at certain times of day with data transmission speeds. Later in the project this was addressed with the provision of European-based servers. Apart from these initial problems, there were no general difficulties in transmitting data, provided that modems and circuits of reasonable capacity were used.

There was a tendency to revise drawings more frequently than when using the traditional, paper-based approach. It was difficult to guarantee that tendering firms had the appropriate technology. However, the system was easy to use after initial training and was well received by works contractors, even most of the smaller firms.

Innovation needs a 'champion' and a real reason if it is to happen. Teamwork is the key to success, and IT is, in the final analysis, no more than another tool to facilitate that. Effective communication helps things happen quickly, but it is essential to drive the IT and not to allow it to drive the process. Finally, the system is a great boon to the O&M and health and safety, functions in that it allows all relevant information to be collected in one place and made available on CD-ROM.

How extranets might have an impact on the building product industry

Project teams are increasingly using extranets to exchange information electronically. Increasingly, building product manufacturers are publishing their technical and product literature electronically, although there is no common standard of presenting data which makes searching for relevant information more difficult and time consuming. Building product suppliers who supply project teams with tools to manage their electronic information may help influence decisions in their favour.

Although decisions on the selection of building materials/products will remain primarily on a price/performance basis, those manufacturers who are able to provide relevant information electronically to project teams via extranets are likely to be perceived more positively against competitors who do not. This again may help to tip the purchase decision in their favour.

Over time, extranets are likely to become the primary channel for communicating building product information to specifiers in project teams. Product manufacturers should be thinking of adapting their product information strategies accordingly. Key areas of development that should be considered are web-based tools that help project teams and buyers evaluate the technical and commercial merits of manufacturers' products more quickly and easily.

Larger subcontractors are beginning to issue their design and record information electronically for incorporation into the health and safety and maintenance manuals. Providing subcontractors with the information they require electronically would provide added value and may help tip purchase decisions to those product suppliers who are most helpful in this area. Smaller subcontractors are finding this area difficult to deal with, so manufacturers who can help them ease this process with training and targeted information packages that meet their needs may also gain a similar advantage.

Although there are many ways in which advanced project collaboration systems are changing the ways in which project teams work, construction still requires people at the 'coal face' rolling up their sleeves and getting their hands dirty. However, as the tools and information available at the front end of projects become more sophisticated, additional training and advice will be required to help subcontractors undertake their work more effectively, utilising the range of information available to them. Product manufacturers who can begin to develop expertise in this area are likely to gain competitive advantage with subcontractors.

This paper was-based on a case study first published in the report by the Building Centre Trust 'Effective Integration of IT in Construction' released in November 2001. The report is free and can be downloaded in PDF format at http://www.buildingcentretrust.org. The case study in the report was compiled with the help of Rod Grinsted of PPT Integration and the Construction Productivity Network.

12.3 Expert paper: Object technology, manufacturers and the web

By Betzy Dinesen

Betzy Dinesen is a freelance editor and writer in the field of AEC, with a particular interest in major projects. She has followed the work of IAI UK since its foundation in 1996 and has shadowed the Teamwork projects.

Introduction

Until recently, the use of the Internet by manufacturers of construction products and systems has been primarily for the purposes of ordering, invoicing and providing a 2D catalogue for specifiers. Many suppliers have made excellent use of EDI (electronic data interchange) for their business processes.

Object technology has been seen as the province of designers and IT professionals, not something that manufacturers need to concern themselves with. To manufacturers, the relevance of object technology always appeared to lie a comfortable distance in the future.

This is no longer the case. Some overseas manufacturers have already begun to offer downloadable products on the web. Object technology is something that UK manufacturers need to consider in the near term as part of their strategy for making their products available to designers and specifiers – and maintaining a sharp competitive edge in the construction supply market.

Background

Step back for a moment and consider the context. Where are the other parties in construction/FM at? What are their goals?

Information dominates the working processes of the parties involved in a construction project, whether they are participating as clients, architects, engineers, constructors, FM operators – or manufacturers. In the past, ways of sharing project information have been clumsy, hindered by software constraints, with particular difficulties when the parties need to work simultaneously on the project.

If the industry were able to share project information swiftly and seamlessly among the parties, and if one company using its preferred software could share project information with another company using different software, the potential efficiency gains would be huge. And if object technology is used to enhance the quality of the information exchanged, business processes could be transformed.

Manufacturers need to come on board and share in this comprehensive information exchange. They can contribute hugely to smoother supply-chain procedures and improved efficiency. The technology may be advanced, but using it presents no real difficulty. In fact, it will make life far easier for both manufacturer and specifier.

International Alliance for Interoperability

If information is to be shared among the players in this disparate, fragmented industry, they need to use software that is interoperable. This was the point of departure for the International Alliance for Interoperability (IAI), a global network of groups that research and promote interoperability.

IAI opened its first Chapter in the US in 1995, with the UK Chapter following a few months later in January 1996. Now there are ten Chapters around the world, with the UK Chapter among the most active. The aim of IAI, to quote from its mission statement, is 'to provide a universal basis for process improvement and information sharing in the construction and facilities management industries, using Industry Foundation Classes (IFCs)'.

The amount of information generated in any AEC project is vast. Steve Race, assistant technical coordinator, IAI UK, has emphasised the importance of managing the information mountain:

'If individual agencies generate their own separate packages of information without common bases, information management will spiral out of control'.[1] This proliferation of packages will lead to a dramatic rise in the number of transactions.

Data standards are needed if information is to be shared efficiently among project professionals. Standards need to be international and independent, not linked to any one software company. These furnish the common basis or common language that can be used in sharing information.

IAI is developing standards (known as the Industry Foundation Classes or IFCs). As a neutral democratic body, representative of the industry as a whole, it is well suited to managing the work.

Interoperability – the commercial reality

IFCs are published in the form of releases. Software companies then incorporate them into their own products. The IAI also offers a certification service, allowing products to be tested in facilitated approval workshops, and to carry the implementation logo. The most recent release is IFC 2x; the next release, IFC 2x Edition 2, is being developed. In the UK, IAI membership includes the large software vendors Bentley Systems UK, Autodesk, Graphisoft and Nemetschek.

Sourcing manufacturers' products via the web – work of the Libraries group

The UK chapter of IAI is concentrating on four areas of activity: design integration (architecture, engineering, etc), FM, construction management and libraries. It is these last two areas that are of greatest interest to manufacturers. The Construction Management group is considering how contractors specify their product requirements. The Libraries group, among other activities, is considering how the information is provided.

Thus the Libraries group is concerned with the task of exploring how best the IFCs can be used to incorporate objects from manufacturers' catalogues (and other external sources) in a design.

This may sound similar to a customer viewing a manufacturer's website or ordering electronically after searching a catalogue on a CD. In fact, it is far more ambitious.

If manufactured products are expressed in the form of Industry Foundation Classes, they provide an enormous amount of information to the designer. This is because they contain attributes. These attributes and relationships tell the designer many things about the product: for example cost, fire rating and thermal properties. The product's relationship with other components is also defined, for example the relationship between a door, a wall and the light switch. All provide a shortcut to efficient design and a real bonus to the designer. For manufacturers, it may mean a significant rethink of how they present their product catalogues.

Early work from the libraries domain looked at the theoretical aspects: how external libraries could be classified and designed. A 'demonstrator project' studied how manufacturers could create their own property sets (a kind of 'meta-model' or software 'container' for a manufacturer's objects) with simplified views of their products and how the property sets could be used for parametric searches.

In down-to-earth terms, this means that if, in future, an architect wants to source, say, a door, he will be able to search the manufacturer's catalogue, structured through the use of a property set, in order to find the product required.

A project, led by IAI UK, is under way at the moment to explore how objects can be 'dragged and dropped' from the web into project models used by construction professionals.

The future is soon

In the UK, this ability lies in the future, but the near future. A representative of the Libraries group states that 'there is a growing interest in the technology, both among users – architects and engineers – and among manufacturers who want to make their products available in this way'.[2] And the technological framework is there.

The Libraries group is working on a PII (Partners in Innovation) project, funded by DTI, in the pre-cast concrete manufacturing sector. It is exploring the links between manufacturer websites and CAD systems, so that designers will be able to hook into the suppliers' websites. "We are pushing out into industry, using the pre-cast concrete sector for our first industrial trial," says the group.[3]

Once pilot work in the pre-cast concrete sector is complete, the findings and methodology can be extended to other manufacturing sectors.

IFCs at work

IAI lies at the strategic end of the interoperability spectrum. It identifies areas where IFCs need to be added or improved.

It is at the level of construction projects, whether real or demonstration, that IFCs work in practice. The IAI does not track the companies who buy and use commercial products that incorporate IFCs – that is beyond its role. But it does follow the demonstration work of one of its member companies, Virtual First, which runs a series of projects known as the Teamwork projects. Virtual First is entirely separate from IAI UK, but its goals complement those of IAI, and a number of firms who are members of IAI are also members of Virtual First.

Teamwork projects

The Teamwork projects have been set up by Virtual First to explore the potential of virtual prototyping: 'to build before we build, to occupy before we've built'.[4] Each year, a demonstration project is conducted. The teams are put together in the spring and take part in practice sessions. The team members then co-locate in London during a Live Week in order to meet an ambitious design challenge, exploring ideas that would lead to efficiency gains later on in the construction process. (There will also be a presence and presentation at Interbuild, NEC, Birmingham, in 2002).

In Teamwork 2001, three manufacturers took part, with the aim of showing the prospective benefits of integrating suppliers in the process:

"The specification for a steel beam and connection was 'uploaded' from the project model to Bourne Steel, a structural steel contractor, via Xsteel. The status of the item could be monitored remotely by the [Teamwork 2001] team, via the Internet, on the control system at the fabrication plant. The steel was ordered on the Wednesday, and [after a subsequent design modification] a change to the specification was smoothly accommodated by the manufacturer."[5]

This is precisely the type of web-enabled collaboration between designer and manufacturer that IAI seeks to realise on an industry-wide basis. Although the interoperability was not via an IFC for that particular exchange, it gives an idea of the shape of things to come.

Composite panelling manufacturer Powerwall produced panelling components for the project and a reinforcement mat was produced by the fabricator, Hy-Ten. The products manufactured for the projects were on show on the last day of Live Week.

Manufacturer participation

There are strong benefits to manufacturers in participating in the developing use of the web. They can do this as players or spectators.

Keeping abreast of the literature – through journals, conferences, papers or reports (such as those published by Barbour) – is the spectator approach. The player approach allows the manufacturer to be involved in the whole process of development.

By joining IAI, manufacturers can help advise, as non-IT laymen, in the development of standards and say what is most relevant to them. IAI is a membership organisation (fee depends on company size). The practical Teamwork projects are run by Virtual First, also a membership organisation. However, non-members may participate in the annual Teamwork project (a modest fee is payable) and manufacturers are especially welcome. The manufacturers who participated last year were enthusiastic about the benefits. Contact details are given after the references.

References

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[2] Conversation with James Nyambayo, representative of the Libraries group and IT researcher at BRE, 9 May 2002.
[3] Ibid.
[4] Teamwork 2000: An experiment in collaborative working, Business Round Table, 2 Church Road, Kenley, Surrey, CR8 4DU (September 2001).
[5] Teamwork 2001: Collaborative working put to the test (forthcoming).

Contact points

For both IAI and Teamwork, contact either Christopher Groome (brt-groome@dial.pipex.com) or Beryl Garcka (brt-garcka@dial.pipex.com; tel 020 8660 1631). Websites: www.iai.org.uk and www.virtualfirst.org.

12.4 Expert paper: The impact of e-business on the UK construction industry

By Peter Goodwin

Introduction

e-business offers firms an unprecedented array of powerful business tools to communicate and interact with customers, suppliers and intermediaries and is bringing significant benefits to many industry sectors, including the construction industry.

In construction, significant steps have been made in providing powerful tools to enable project teams to work together more effectively through project extranets and for tendering to be undertaken with greater efficiency.

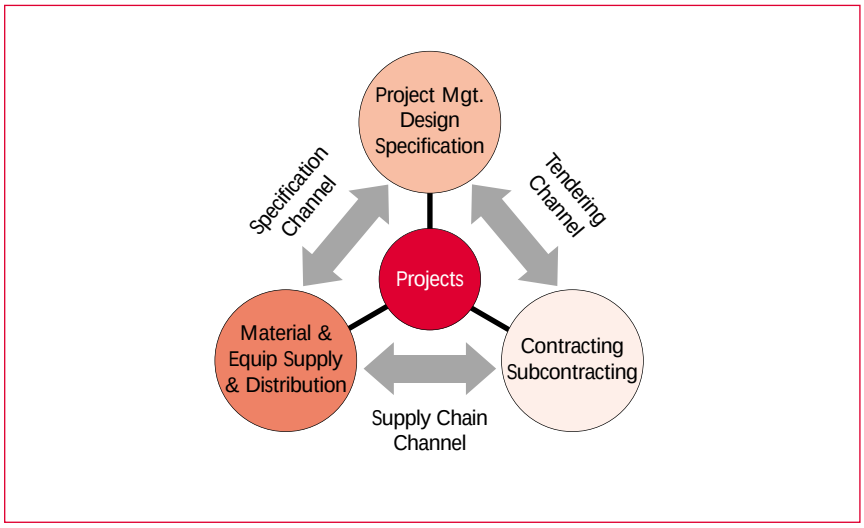
However, a number of areas have not achieved their expected potential. The more adventurous e-business proposals such as procurement hubs and trading communities have failed to gain a critical mass of customers and suppliers. This has led to consolidation in the industry as firms focus on their core revenue producing services to ensure survival.

In addition, many mainstream industry firms are unsure of how to go forward with their e-business strategies because they rightfully perceive that conditions in the fragmented construction industry, with its project-based procurement, require a different approach to other industry sectors.

An industry model for the e-business age

To help construction industry managers understand e-business issues, a simple model has been developed to throw some light on this complex area.

Construction industry key sectors and channels



The model divides the industry into four sectors:

1. **Design, Specification and Project Management.** This sector undertakes the design, specification and management of the project.
2. **Contracting and Subcontracting:** This sector builds the project through the contracting route.
3. **Material and Equipment Supply and Distribution.** This sector provides the materials and components for the project, predominantly to the contracting and subcontracting sector.
4. **Projects.** All parties in the industry collaborate on projects and these are shown in a central position at the core of the model.

All four sectors interact and communicate both internally and with the other sectors via 'channels' as described below:

- The Tendering Channel links design and contracting sectors. The principal two-way communication is the flow of tendering information.
- The Specification Channel links materials and equipment with design to enable projects to be specified. Information intermediaries feature in this channel to help designers and specifiers cope with the vast quantity of information available.
- The Supply Chain Channel links contracting with materials and equipment supply and distribution. Transactions in the Supply Chain Channel probably account for around 90% of the value of projects.

To understand the impact of e-business on the construction industry, it is useful to look at each of these channels and developments within them. Projects are also considered as a separate entity.

Projects

e-business has provided powerful project extranets that enable teams to exchange information at low cost. This trend is set to continue. At present, they mainly act as post boxes and some firms have difficulty in getting them to work with their own internal processes. This situation is improving rapidly, however, as the tools develop and uptake increases.

The development of project information management frameworks that enable common project information exchange standards to be agreed at the outset of projects will improve the effectiveness of extranets.

The availability of broadband connections, both hard wired (DSL) and mobile (3G), will make communicating on projects much more effective. Widespread adoption of broadband is likely to make extranets the primary form of project communication within the next 3 years.

The Tendering Channel

Powerful e-business tendering tools are enhancing the exchange of information between designers and contractors/subcontractors. Tendering tools are extensions of project collaboration tools and map processes currently used in the construction industry.

This is a growing new market for many of the e-business ventures with few incumbent firms to get in the way. The clear benefits of the latest tools are likely to speed uptake of these services over the next 3 to 5 years and many further innovations will be seen in this arena.

Product suppliers should be aware of the development of these tools and consider how they might evolve their existing services to buyers to take advantage of these new technologies.

The Specification Channel

The Specification Channel provides materials and manufacturers' product information to designers and specifiers. There is a huge information requirement in this channel and a number of well established intermediaries provide services to help design teams source products for their projects.

The Internet has also enabled materials and equipment firms to provide information directly to specifiers and customers and this source is growing exponentially. Many new portals are also offering information hubs enabling specifiers to search for information in a structured way.

This mushrooming of websites providing information on building products and services has not proved as helpful to specifiers as intended. There are many of them and each is different, making it difficult to gather the right information in the limited time available.

As such, for most specifiers, the Internet is not yet the main medium for gathering information with many still relying on traditional sources such as brochures and in-house information. This may slow the uptake of new products and services as specifiers suffer from information overload and keep to what has worked well for them in the past.

Due to high up-front investment and the inertia that has to be overcome to develop effective services in this channel, only limited improvement is expected over the next 3 to 5 years. Independent information portals are likely to be forced to focus on extranet services to generate cash, leaving information provision to others.

Information intermediaries and product suppliers have to work together to deal creatively with these challenging issues so that a positive route forward, beneficial to all, can be achieved.

The Supply Chain Channel

The Supply Chain Channel, together with the contracting/subcontracting and material sectors, represents the bulk of the transaction value of the construction industry and this is where the prize of a successful e-business strategy lies. It is also the most difficult nut to crack.

The current nature of procurement in the construction industry is via contracting and subcontracting, where relatively small companies purchase the bulk of the materials and equipment. Relationships between contractors and subcontractors is also transitory driven by differences in project type and geography and the need for contractors to shop around to obtain the lowest prices.

To achieve success for e-business in this part of the channel is extremely difficult. The largest contractors have only a relatively small share of this market and there are significant difficulties in motivating small independent subcontractors to invest in e-business. Many also fear increased competition with reduced margins. Even consortia of contractors such as Arrideo[1] and Mercadium[2] have failed to overcome these challenges.

The sheer number of groupings that have been trying to capture this space through new e-business trading tools has muddied the water further driving many to adopt a 'sit back and wait' attitude. However, over time, consolidation in the e-business sector, together with the emergence of stronger players such as Asite with a client driven stakeholder base, may bring the industry around to e-procurement.

In view of this situation, it is likely that the focus will move to the area of niche trading hubs that can produce value, and hence cash flows, early on. Success can be found from low risk commodity products and much can be done in this area to generate new markets.

The upstream end of this channel seems to offer more potential. This is where the merchants and product suppliers operate. These businesses have long-term relationships with their supply chain and operate on a production rather than on a project basis and are able to balance supply with aggregate demand over a large number of projects. This sector of the channel has the potential to roll out true e-business solutions that have been successfully implemented in other industries such as automotive, aerospace and retailing.

Merchants may be able to entice their customers on board at a later stage once the initial e-business solutions are established in the upstream supply chain. If they can offer smaller customers clear benefits of using the web without significant investment, the merchant sector could complete the transition to full e-business much more quickly.

The merchant sector may then have the scale to move into the Specification Channel through their ability to aggregate information from their suppliers and provide this in a searchable, ordered way to specifiers.

As a counter to this development, the merchants have to contend with the activities of the larger materials and equipment providers who have been merging in recent years, increasing their market reach and power. Many of these firms are adopting direct supply strategies to Contractors and Subcontractors and the quality of the information they provide to specifiers via their websites is impressive.

Specialist logistics firms are also entering the market and this may extend opportunities for smaller firms to supply direct to larger projects. The outcome may mean that the merchant sector expands e-business ventures in the small builder market whilst continuing to co-exist with the large materials producers in the large project sector.

Conclusions

e-business is here to stay. e-business offers the construction industry a powerful array of tools to communicate and collaborate and should go some way to helping overcome many of the endemic problems of the industry.

e-business is very much in the transition stage with many ventures merging or collaborating with former competitors or re-focusing on core value adding areas. Pan-European consolidation is bringing to the fore e-business corporations of considerable potential to change the construction industry.

Business models for the development of information hubs and trading communities have not succeeded, as they have to build a critical mass of information suppliers and users. They also have to cope with industry processes that are slow to change and present subtle challenges.

As such, initial progress in procurement is more likely to be in niche areas that can quickly generate cash such as trading commodity products with simple information requirements.

Mainstream construction procurement is also likely to require the involvement of major players in the industry such as merchants and heavy building materials suppliers extending their e-business ventures. These sectors have the size and existing customer base to be able to build sustainable e-business procurement solutions over the longer term. e-business tools could enable them to communicate much more effectively with customers and suppliers and so play a larger role as the construction industry takes advantage of the benefits of e-business over the next 5 years.

If the merchant sector can develop this role, it might also be well placed to provide structured electronic information to specifiers. However, this thrust could come from many sectors and all major firms should be thinking ahead of how e-business might affect the existing power relationships in their sector.

The eventual winners of the e-business race in the construction industry will be those groups of corporations that together can achieve the mandatory requirement of a critical mass of suppliers of information, combined with a broad user base. Those that can will win in the forthcoming battle in the construction e-business theatre, which may change the way construction is specified, purchased and delivered forever.

This paper was-based on the e-business section of the report by the Building Centre Trust entitled 'Effective Integration of IT in Construction' released in November 2001. The report is free and can be downloaded in PDF format at http://www.buildingcentretrust.org.

References

[1] Arrideo was set up by major UK contractors AMEC, Balfour Beatty, Bovis Lend Lease, Kvaerner, John Laing and AEC Venture as a business-to-business exchange offering extranet, tendering, information & procurement services. In April 2001, Arrideo's development was put on hold.

[2] Mercadium was set up in April 2000 by 5 large construction firms to develop a neutral pan European trading hub in building materials. It has since been sold to Causeway Technologies.

12.5 Effect of the Internet on international trading

The Internet has made it easier for specifiers to locate information on overseas products. A question was included in the telephone programme to identify the extent to which specification of overseas products has increased.

13% of respondents said their use of overseas products has increased as a result of sourcing information via the Internet. Technical and Structural Engineers in particular have seen increased use, with one-fifth of each profession sourcing more products from abroad.

Examples quoted of products specified from overseas manufacturers and located through the Internet include glazing, curtain walling, roofing, pre-cast concrete, windows, steelwork, timber structures, bathroom pods.

While the Internet makes it easier for overseas manufacturers to provide information about their products to UK specifiers, so too are opportunities provided to UK manufacturers to promote their products around the world. Manufacturers should take this into account and provide information on their sites about their ability to export products, with appropriate contact points able to discuss how this can be achieved.

13. Conclusions: Website best practice guidelines for manufacturers

The research for this year's Barbour Report has shown a willingness on the part of specifiers to use websites, with the majority using the Internet for product information at least once a week, and an average of 11 sites visited per month. However, it has also identified a number of frustrations experienced when searching for and using sites, and in applying the information. The number of websites which users are able to quote as ones which they hold in high regard is very low, with fewer than 2% stating the most mentioned site. Manufacturers' sites must make a good impression within 3 minutes, or they risk losing the specifier's attention, and potentially their business, as a result.

In this section, suggestions and best practice guidance is given, designed to assist manufacturers in using their websites to optimum effect, and to gain competitive advantage. Conclusions and recommendations are based on the research findings.

Ensuring users can find your site

Specifiers and other product decision-makers use websites:

1. When they have already identified a manufacturer as suitable and they need further information.
2. When they are looking for lists of products/manufacturers.
3. To find alternatives.

82% use general search engines and 35% online building product directories. 39% use the Internet to go to a manufacturer's site when they already know the address. This means that manufacturers must make their information available across hard copy and electronic media to ensure effective exposure of their product ranges.

Manufacturers should also ensure that products, brand names and any key words which may be used by specifiers are registered with the search engines and online building product directories wherever possible. Site addresses should be shown on all hard copy literature and advertising.

Structuring the site

There are certain features of websites which are critical. These are:

1. Technical information.
2. Search facilities to find suitable products or information.
3. Contact details.
4. Downloadable diagrams and specification clauses.
5. Photos and visuals.
6. CAD compatible features (if appropriate to product).

Many of these critical areas were identified as being most in need of improvement on manufacturers' sites. As such, material producers should concentrate on developing these features over and above those which are seen as 'nice to have'.

It is strongly recommended that manufacturers consider the following:

Home page	Ensure that this is not too cluttered or 'busy'. The content of subsequent sections should be clearly indicated in menus and icons which should be easy to use and follow. Consider providing an explanation of how users can get the most out of the site, and how it can help them. Lack of clarity in navigation may lead to useful features remaining undiscovered.
Search	Understand how your target market expects to search for information. Your website should mimic their search processes for information on your generic product type.
Intuitive approach	Users are not experts in your products. They welcome suggestions and 'have you thought about' type approaches.
Solutions	Users want solutions to problems not just information. Ideally they want to be told what to use in given situations and how to specify.
Comfortable cursor range	It can be irritating to have to continually return to menus which are at the extremes of the page and require a lot of cursor movement.
Consistency	Menus and instructions should remain consistent throughout the site.
Clickability	Ensure as few clicks as possible are required to reach the information.
Log-ins	These act as a major deterrent to use.
Up to date	There is an expectation that information on websites is up to date. Date stamping content adds credibility and is a valuable proof of recency. Users expect to see guidance on the latest regulations and how they may use your products to conform.

Tools	Provide downloadable details, diagrams, specification clauses and CAD compatible drawings.
Photos and visuals	Speed of downloading photos is not an issue for the large practices, but small practices which mainly use modem connections may become frustrated if there are a lot of photos. Minimise the number to a page and provide thumbnails. By clicking on photos users expect to be provided with information on dimensions, suitability, materials etc.
Technical information	Information provided in hard copy should be made available electronically, eg performance, compliance with BS, certification, environmental policies.
Contact details	Users require phone numbers and names of individuals. The facility to email should also be provided.
Company information	Corporate information is considered unnecessary by users but from the company's viewpoint it is of course important to establish credibility. Keep to a minimum.
Case studies	Provide examples of projects using your products.
Downloadable product data	Full literature is not essential, but provide the facility for users to email a request for brochures, which should be made available promptly. Summary information or data sheets available online are usually sufficient.
Export capability	Websites make your products more accessible to overseas specifiers. Export capability and contact points should be mentioned.
IT features	Users would like to mark useful pages or sections and be able to compare products across pages and sites (spilt screen).

Next steps and being prepared

A high proportion of users are very likely to make direct contact as a result of using a website, for more information and guidance on specific applications. Technical helplines continue to be important.

Integrating the website with the marketing mix

The company website is an important part of the marketing mix. As well as creating awareness of the website address via literature and in any advertising, sales staff should demonstrate the features and facilities available via the website to customers, whilst visiting them. Technical helpline staff can also guide callers through using the website.

Many manufacturers have made significant investments in their websites. In describing how specifiers wish to use the Internet, it is hoped that this Report will act as a guide to future development, and, ultimately, encourage greater use of the Internet for the sourcing of product information.

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