ELECTRONIC INFORMATION IN THE NEXT MILLENNIUM: THE NEW LANDSCAPE

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Infomedia ‘98, Prague, 20 May 1998

Although the new millennium is less than two years away, the changes currently taking place in the global information industry are so rapid that it is almost impossible to predict so far ahead as the year 2000. The implications for central Europe are especially important; in the new millennium, geographic location will matter much less than entrepreneurialism, ingenuity in exploiting the technology and excellent telecommunications. But these implications do not always come from where we expect them, and we must be prepared for surprises.

The prospects for information professionals are especially bright. Far from being threatened by the end-user revolution, the explosive growth in public awareness of the potential of information offers us our greatest opportunity ever - if only we have the courage to take it. But in order to build an effective information strategy for the millennium, we must look beyond our own back yard to the real world outside.

Tim Owen is the Principal Information Officer at the London Research Centre, a British social research organisation specialising in urban issues. He is also the editor of Business Information Review, and writes regularly for Information World Review and other publications. In this opening session of Infomedia 98, he leaves the information industry’s private concerns behind, and goes looking for the big picture.

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Plus c'a change, plus c'a la meme chose

We stand on the threshold of great change - social, economic, political, cultural. The world is shrinking rapidly. With a few distressing exceptions, we have greater potential to enjoy the fruits of a peace dividend than ever before. Distances that seemed impossibly unbreachable just a few years ago now represent no barrier at all, and the opportunities that this opens up for wealth creation are limited only by our own imagination and enterprise in dreaming up new ways of doing business.

As the century comes to an end, it is especially exciting to be in the information industry. Business and government have come to recognise that efficient and creative exploitation of information is vitally important for our future prosperity and peace. And as the world shrinks, we are increasingly doing business with people whom we do not know. This opens up new needs for essential information to support business decisions. Technology is the driving force behind the acceleration of the change.

But as the French say, the more things change, the more they stay the same. Take Dun & Bradstreet - the company reporting and credit rating business. The technology that first drove Dun & Bradstreet's development was not computing or telecommunications, but the American railroads. It was the technology of the nineteenth century, not the twentieth, that was allowing trade to take place between people who did not know each other. "In that situation a vacuum was created," said D&B's Director of Electronic Commerce for Europe, Gehan Talwatte, "You needed trust services, you needed verification services, you needed business information services, you needed risk analysis services, and that was where Dun & Bradstreet came in." [1]

So at the end of the twentieth century, what is different? If you think about it, remarkably little. Once again, we are in a period of comparative world peace. Once again, democratic systems of government are spreading as regimes recognise that, in order to be prosperous, you must have a well educated population, and you can't stop well educated people from being critical of the circumstances in which they live and wanting to bring about social and political improvements as well as economic ones. Once again, people's demand for information is an essential by-product of this change and technology is the facilitator. This development certainly has been predicted; my colleague Barbara Buckley, who's speaking next, told me recently that at a British Library Association conference back in 1982, she heard Tom Stonier, who was professor of science & society at Bradford University, forecast that telecommunications developments would lead to the downfall of Communism. So some things we can predict. But, amid all this change, we can be certain of only one thing - that we don't know what we don't know.

Railways have proved remarkably resilient as a technology. One hundred and fifty years after their first exploitation, they are increasingly seen as a solution to the movement of large numbers of people and goods across land with far less environmental impact then either road traffic or aircraft. But the same is not true of the steamships whose development paralleled that of the railways. Their greatest contribution to twentieth century development turns out to have been the laying of the first submarine cables. Isn't it extraordinary, in fact, that the telecommunications that are going to play so crucial a role in the twenty first century were already finding applications in the nineteenth, whereas the idea of flying in craft that were heavier than air was regarded as an impossible dream.

Just over a hundred years ago, writer Jules Verne sent his hero Phileas Fogg around the world in eighty days. Railways, steamships and the telegraph all combined to make that journey possible. In the original novel, air travel had nothing to do with it. If anyone had suggested that, one hundred years later, it would be possible for an ordinary traveller to buy a ticket and fly round the world in perhaps five per cent of the time that it took Phileas Fogg, no-one would have believed them. Tragically, it took two world wars to give aerospace technology the thrust that it needed - and it was code-breaking activities in the second of those two wars that laid the ground for the development of computers. At the peaceful and prosperous end of the nineteenth century, neither of those wars was predictable.

And what of the end of the twentieth? About ten years ago, I attended a seminar that was addressed by a member of a British think tank - a political consultancy. To my shame, I can't now remember who it was, but I do remember that he made two predictions - the reunification of Germany and the break-up of the Soviet Union. Maybe one or two people believed his first prediction, but I don't think anybody believed the second. I think this tells us two things - that we don't know what we don't know, and that we must learn to think dangerously.

Challenging conventional wisdom

So I would like to open this conference by challenging some of the conventional wisdom on which our own industry is based. It really isn't difficult to do, because we have all been guilty of getting so many predictions wrong in the past. Here, for example, are some of the assumptions that were informing our decisions as information professionals just over two years ago.

* The Internet is not a viable business information tool.
* The mass market to come from structured proprietary consumer online services.
* Online services are "dead in the water" - being replaced by CD-ROMs.
* MAID is an upstart, small scale player, occupying no more than a niche.

How wrong could we be? Since then, business information providers have been rushing to the Web, and proprietary consumer online services have flared & finished - EOL and News Eye-Q have vanished, and even CompuServe, one of the world's biggest, has had to merge protectively with AOL. CD-ROMs appear to offer almost no business advantages over the Web. (I have no doubt that all of the many CD-ROM publishers from whom you will be hearing over the next few days will challenge that. If they do - challenge them back!). And finally MAID, as the Dialog Corporation, is now the biggest player in commercial online.

Anybody has the right to make a wrong prediction - the one about the Internet not being a viable business information tool, for example, was made by the Dialog Corporation's head Dan Wagner back in about 1993 [2]. Dan, however, is big enough to recognise and acknowledge his mistakes, and has since then reaped a well deserved reward as the pioneer of commercial information on the Web. To emphasise the point, here are just a few more wrong predictions that have gained wide currency over the last couple of years:

* Full text online services will kill the need for indexing & abstracting.
* End users will be able to find everything for themselves.
* There will be no role for information intermediaries.
* It will be less and less viable for niche players to go it alone online.

Whereas actually, we find that full text online is rapidly become insupportable without indexing, and end users increasingly floundering amid information overload. So the implications for information intermediaries are naturally very promising. But so too are the opportunities for highly specialised, niche players, who can compete on the Web on equal terms with established global players.

All these predictions have been proved wrong, and there is no guarantee that the present ones will be any better. The temptation to make predictions for the millennium is irresistible, and I suppose it is becoming easier to get them right, if only because the target date for our forecasts is moving closer all the time. All the same, 18 months is an aeon in information industry terms, and I can offer no guarantees that my predictions will be any more accurate than anyone else's. Nevertheless, I'm prepared to take the risk because thinking dangerously is not just an interesting thing to do - it's actually a vital survival tool.

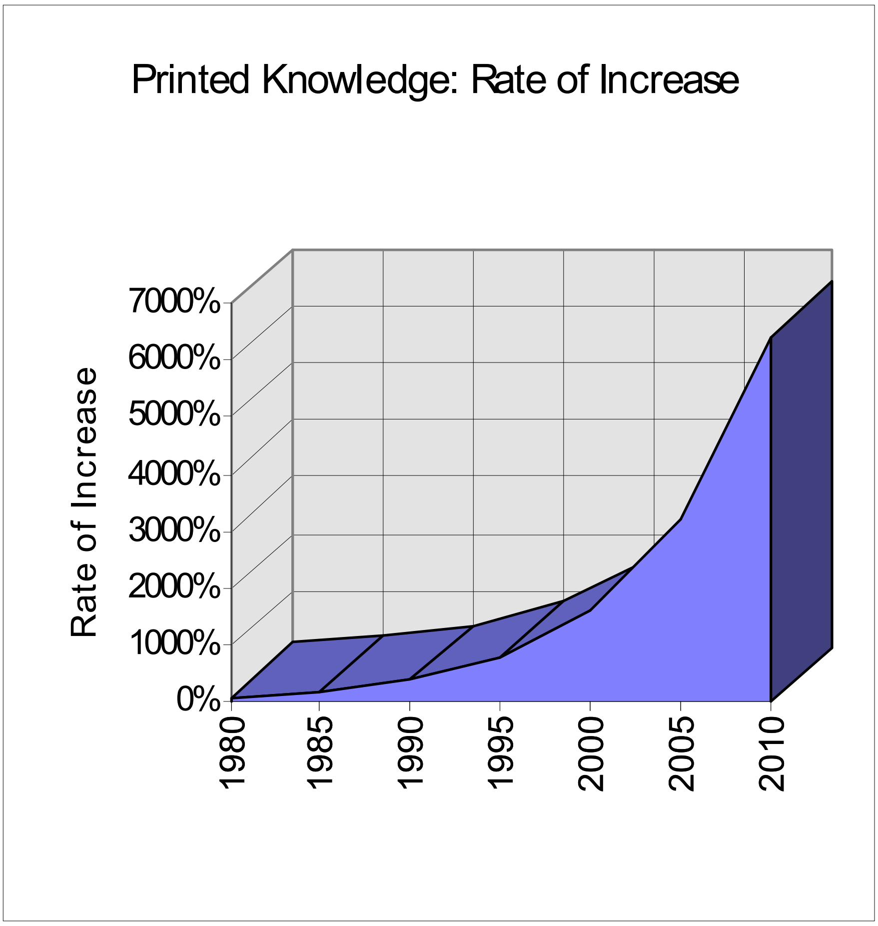
So here are just three statements about the current state of information that I believe we must challenge if we are not to delude ourselves and risk extinction in the process...

	RightWrong
We are living in the Information Age.	▶
End-users will increasingly seek out their own information.	▶
English will oust all other tongues as the world's language of commerce.	▶

Every age is the Age of Information

To say that we late twentieth century people are the first to live in an information age is, I believe, a monumental piece of arrogance. Our drive for wealth creation has always been powered by our growing knowledge and by the increasing sophistication of the available tools with which we could exploit that knowledge. The engineers and entrepreneurs of the late nineteenth century had as their information tools the growth of elementary education, cheap printing and publishing, and the first vestiges of telecommunications. The people of the Renaissance in the sixteenth and seventeenth centuries had the growth of printed literature, allied to a language with universal currency throughout the settled world - Latin. The ancient Romans and Greeks were among the earliest civilisations to record knowledge systematically by hand, allowing them to develop exportable administrative systems, on the basis of which commerce could develop - albeit on different scales and with different spheres of influence. If you like, the Romans were the Microsoft of the ancient world and the Greeks were the Apple Macs. Going further back still, ancient trading cities like Babylon were successful because their citizens knew both markets and prices. So the information age is not new.

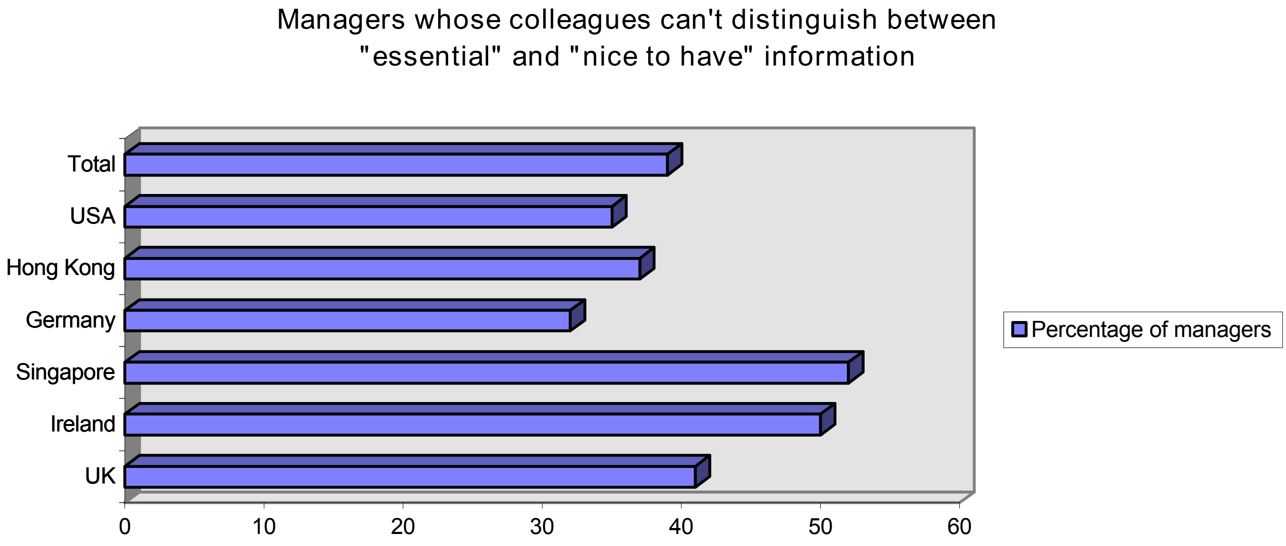
What is different, then? Principally the scale of the operation. More information has been produced in the last 30 years than in the previous 5,000. The average twentieth century person encounters more information in the New York Times each weekday than Renaissance man or woman would have done in an entire lifetime. About 1,000 books are published internationally every day and the total of all printed knowledge doubles every five years. Not only that, but computer technology allows us to find that information nearly instantaneously. We lack the natural filters that our ancestors had - filters imposed because, until now, publishing was expensive and only a selection of the knowledge that was in people's heads ever made it to the printed page.



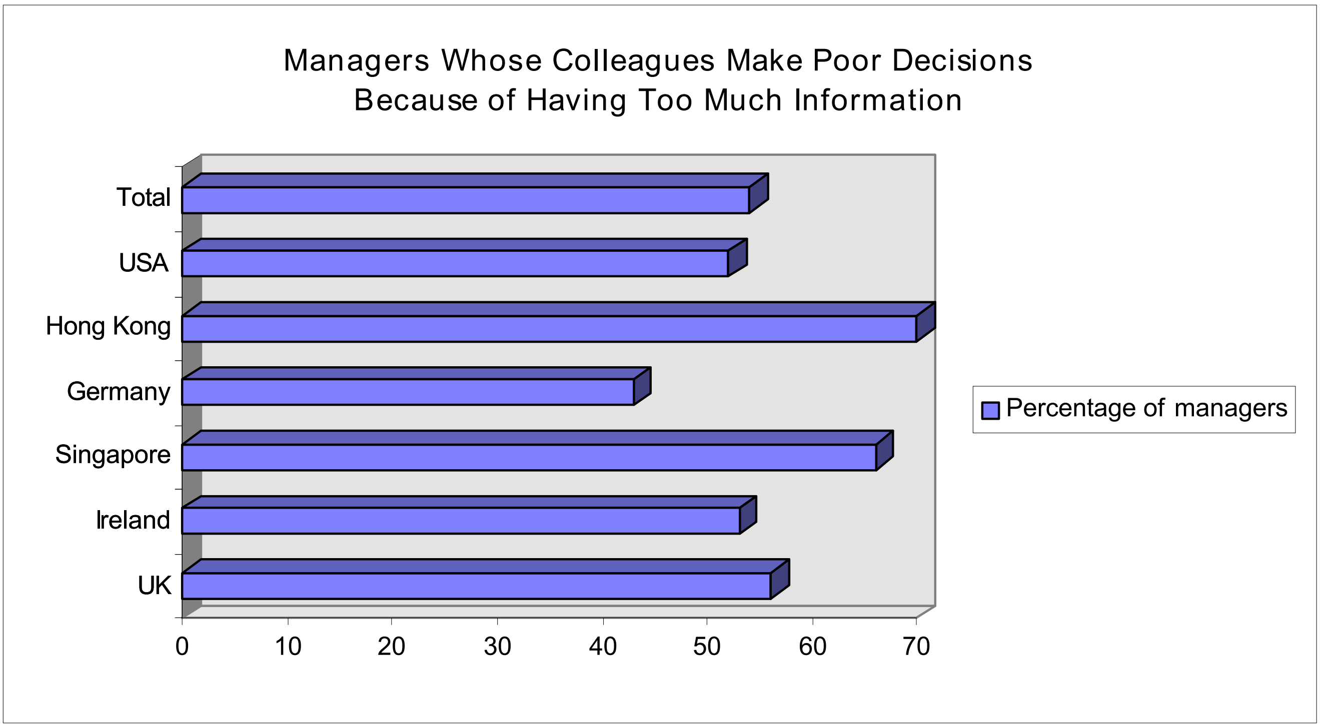
The figures come from Dying for Information?, a survey commissioned by the British information company Reuters in 1996 [3]. It painted a gloomy picture of stress, health problems and relationship breakdowns all caused by the fact the people had far too much information to process in their work. And, it made clear, it was going to get worse, not better. Certainly the graph looks alarming. But it also represents one of the best opportunities that information professionals have ever had.

Just think about the reality behind Reuters' cataclysmic statistics. No doubt 1,000 books are published internationally each day - but many of them are what we call in English "coffee table books" - they look pretty, but they are derived from other sources and their new information content is slight. Others are what we call vanity publishing - they do more for the reputation of the academic author, who needs to be seen to be published, than they do for the reader. Others again are incomprehensible because they are in Chinese. So it's not the total of all printed knowledge that doubles every 5 years, only the total of printed words; the trick is knowing which ones to read. The fact that more information has been produced in last 30 years than in the previous 5,000 merely reflects the fact that we can now record more, cheaply - including all the short term trivia. Maybe the New York Times does have more information than a seventeenth century person would encounter in a lifetime. But you don't read all of it - maybe you ignore the classified advertisements, the lonely hearts page, the fashion, the cookery, the sport. We are all different. Also, this statistic ignores the oral tradition of the seventeenth century - a time when a book cost rather more than a Rolls Royce does today. On this basis, information overload is a much more manageable problem.

But the stress that the Reuters' report referred to is all too real. And its follow-up report, Glued to the Screen [4], raises the problem to a form of addiction. In this report, behavioural addiction expert Dr Mark Griffiths listed the main components of addictive behaviour as salience (an activity taking up a lot of time), mood modification (getting a reliable "buzz" or "high" from the activity), tolerance (needing more and more of it), and withdrawal symptoms (moodiness or irritability when deprived of it), alongside cravings and feelings of being out of control. He then went on to show how Internet use could produce similar chemical changes in the body as occurred with pathological gamblers, including heightened adrenaline, endorphin and cerebral spinal fluid.

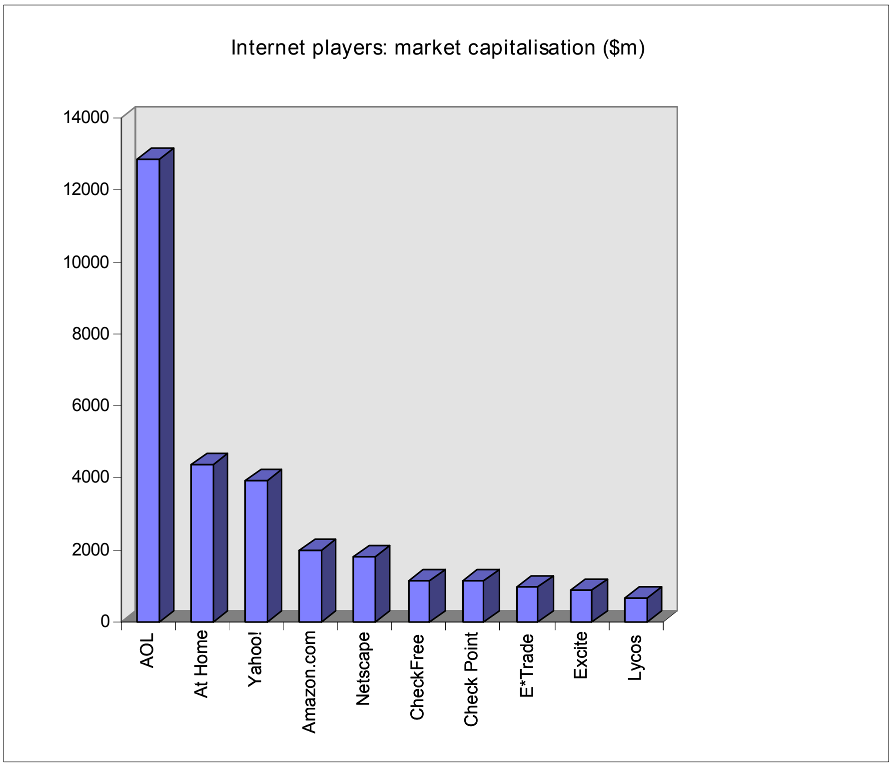


Dying for Information produces some fascinating international findings. According to the survey, around half of all managers are saying that their colleagues cannot distinguish between information that is "essential" and information that is merely "nice to have". (Query: Do they really mean their colleagues, or are they actually admitting to having this problem themselves?) They go on to say that this inability to discriminate between useful and worthless information is causing their colleagues to make poor business decisions.



Knowledge management is the current fashionable way of describing the systems we set in place for making the best use of all the information resources at an organisation's disposal. It really is the buzzword of the year - so much so that in Britain we recently launched an entire magazine devoted to the subject. In it, one of Europe's experts on the subject, Professor Clive Holtham of the City University Business School in London, delivers some uncomfortable truths about the reality of knowledge management. Knowledge management is a fad, he says, which will have died by the Millennium. Top executives will tire of it once they discover that paying to put the intranet in place is only the start. They haven't worked out, he believes, that you then have to keep on paying to ensure that the information you put on the system is worth having and efficiently retrievable. Once they do, he says, they will lose interest and move onto the next management fad. So convinced is he of this that he is actually advising people not to have the word "knowledge" in their job titles, because when top management tires of it, that will be the obvious person to sack [5].

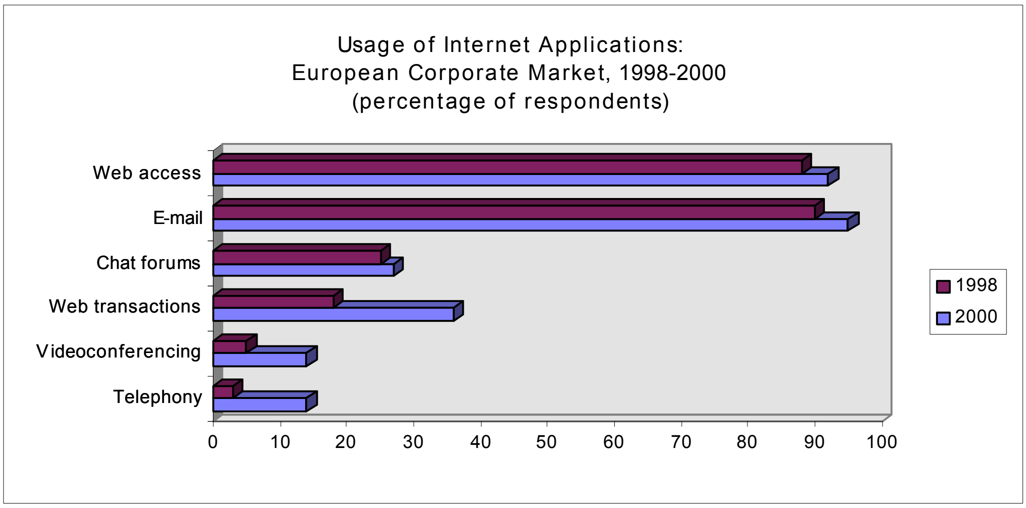
So does that mean that all is lost? Certainly not! On the contrary, it represents our best opportunity ever. Once the fad dies down, managers' need for information will be no less. The difference is simply that they will go back to doing what it is their job to do - engaging in commerce. We in the information industry are right to be excited at the opportunities presented by the current widespread business interest in information. But we must not delude ourselves that they are interested in us. They are interested only in new ways of doing business, and it is the communications potential of the Internet and intranets that interests them, rather than its potential for delivering external information. That is an extra, and one with which managers are having difficulty dealing. If you doubt this, just look at the top Internet companies in terms of their market capitalisation - in other words in terms of what stock markets think they are worth as an investment.



These figures come from the journal PCQuote, reproduced in the Financial Times [6]. Dominating all is AOL - now of course incorporating CompuServe. It's the world's largest Internet service provider, and it is not hesitating to use its commercial muscle. "Size allows them to extort money from anyone who wants to sell anything on the Web," said Keith Benjamin, the entertainment analyst at Banc-America Robertson-Stephens in the FT recently [7], backing up earlier comments by the paper's Internet guru Tim Jackson, who reported that the rival booksellers Amazon.com and Barnes & Noble were paying AOL for the privilege of being allowed to publish their catalogues online. "AOL has made that subtle transformation, so far achieved in the computer industry only by Microsoft and Intel, from being a competitor in its market to being... a company with which others do business by necessity." [8]

Amazon.com does feature in this league table, as do two other electronic commerce providers - CheckFree, which provides online bill payment services, and E*Trade, an online broker. Three of the others - Yahoo!, Excite and Lycos - are search engines; they are of interest to investors because they are heavily visited sites and therefore suitable vehicles for online advertising - commerce again. Of the remainder, At Home provides Internet services by cable, and Netscape really started the Web's phenomenal popularity off - yet there it is somewhere in the middle of the also-rans. This is a cruel and fickle industry.

If further proof were needed that commerce, not plain information, is powering the current interest in the information industry, then it comes in a new report from the information technology analyst Ovum [9]. Once again, it shows that the Internet applications that interest business people are not plain information services, but Web transactions. This is the only application that is currently well established and will grow strongly, the authors say. Videoconferencing and Internet telephony will achieve strong growth, they believe, but from a very low user base today.

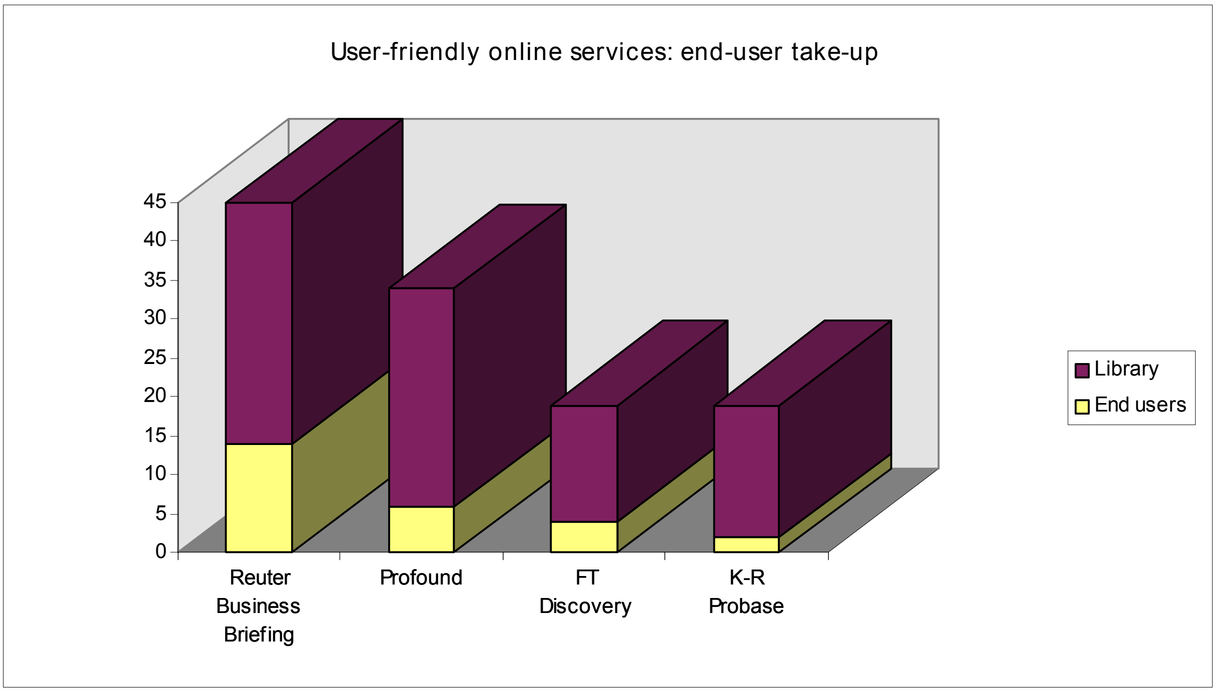


So where does that leave us in the information industry - whether providers or intermediaries? With a very important role to play, and a marvellous opportunity, if only we can seize it. But we must also know our place. Our job is to support commerce - or technological or academic research, if that is our particular information speciality. To put our achievements in perspective, just bear in mind that, when MAID and Knight Ridder came together to form the largest professional online service in the world by market share, Knight Ridder had 160,000 password holders and MAID just 5,000 subscribers. By comparison, AOL has over 10 million. That's why I say that we are not living in the information age.

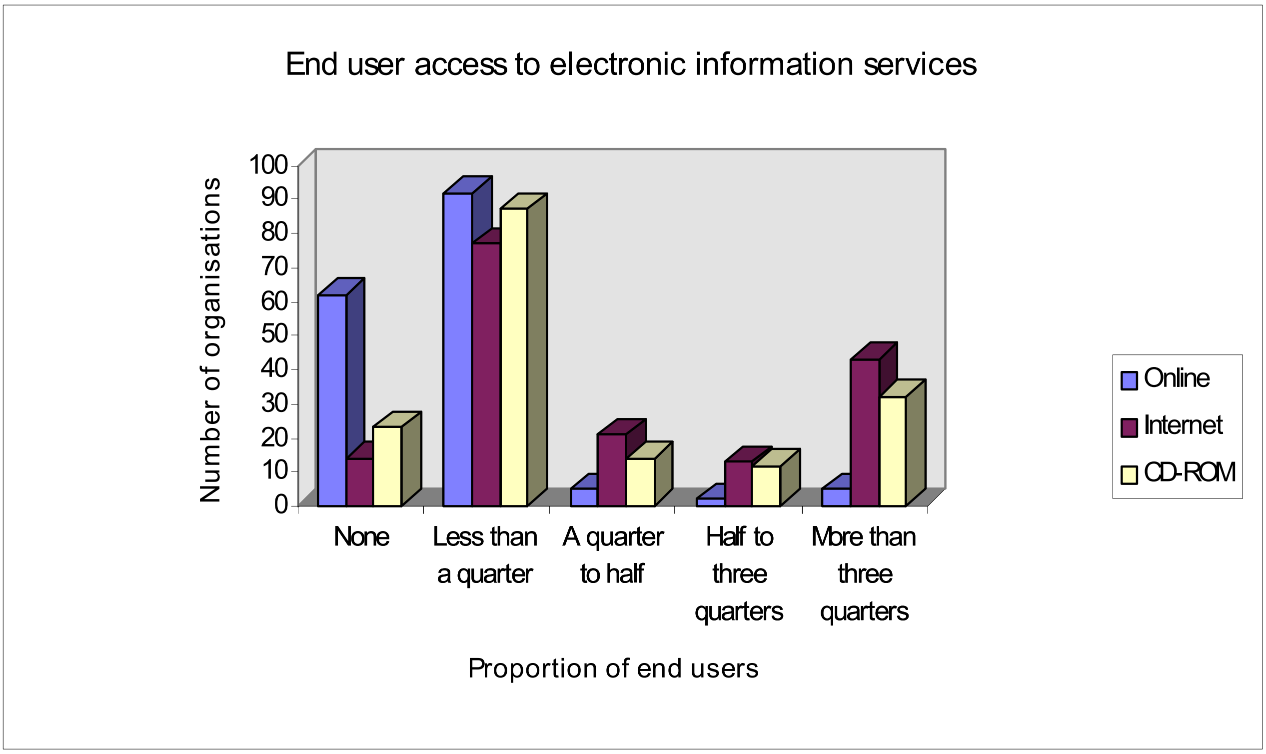
Whatever happened to push technology?

This year the fad is knowledge management. Last year it was push technology. I get the impression that database providers are now soft pedalling on that phrase. It has had a bad press. Push implies pressure and, as we see from the Reuters findings, pressure of information is just what managers don't want. Knowledge management sounds much more reassuring, much more organised, much more disciplined - and discipline in information is exactly what we all want. But, like the information age, push technology is not a new concept either. We have had it since at least the eighteenth century, in the form of newspapers. Amid all the myriad sources from which we can now receive information, isn't it remarkable that some of the most successful commercial Web sites are those run by newspapers or newspaper publishers - FT.com, Wall Street Journal Interactive, Economist Intelligence Unit? These are well designed Web sites but - more than that - they are put together by people who have an instinct for what is news. Long experience tells them what is important, what is going to bring about change - and what is not. So they act as a filter, and they are a far more effective vehicle for push than indiscriminate gleanings from the Web as purveyed by, for example PointCast. They may even be more effective than the structured offerings provided by Reuters Business Briefing and Corporate Profound.

Certainly there is evidence to suggest that managers are not using the simple services that were originally designed explicitly for them. It comes from the Headland Annual Business Information Resources Survey, a yearly poll of United Kingdom business librarians and information managers, published in Business Information Review [10]. This shows that the percentage of end-users with direct access to dial-up online services remains low - nearly 40% of responding organisations offered no dial-up access to end users at all, and even where they did, the leading brands of user-friendly services remain overwhelmingly library based.



The figures for the news services, for which push seems a particularly appropriate vehicle, are even more stark. Use of Individual's First! service was reported by only four end-users and one library. NewsEDGE was used by just three end-users and three libraries. (These services have now merged as the NewsEDGE Corporation.) PointCast mustered just three end-users and seven libraries. The more structured services - LiveWire from Profound, News Alert from FT Discovery and News Explorer from Reuters - trailed even further behind.



Even end-user access to the Internet and CD-ROMs is still patchy. Of 200 reporting organisations, only 43 offered Internet access to more than three quarters of their staff. No killer application appears to have emerged for the Web yet either. The largest single use seems to be visiting the Web sites of individual companies, reported by 95 organisations. This is of course something that costs managers nothing, and is merely an extension of what they have always done, which is to glean what they can about competitors from their annual reports. Ninety per cent of the corporate information units that responded were using the Web already, and almost all the rest intended to start using it within the next 12 months. However, corporate librarians were much less certain what its future impact would be. Nearly three quarters believed that it would change the nature of the demand for library and information services, and most of the rest thought it would either increase demand for library services, or have no effect on demand at all. Only 4% thought that the Web would reduce demand for their services. Evidence enough, I think, that we are still far from achieving an end-user revolution, and that rumours of the death of the intermediary have been much exaggerated.

Maybe we should not be too surprised about these two misconceptions - the age of information and the dawning of end-user empowerment. After all, they are closely linked. Much of the current interest in knowledge management and push technology has come about because it has taken managers no time to realise that they now have the infrastructure to gather, store and distribute information from a multiplicity of sources. Intranets potentially offer access to every document that an organisation holds and, beyond that, the Internet allows them to gather an infinite amount more and deliver it. But, beyond that, they are managers, not information or knowledge specialists. They don't see the need to organise, classify and index knowledge, firstly because this organisation of knowledge is largely invisible to the end-user, and secondly because it is not their trade - it's ours.

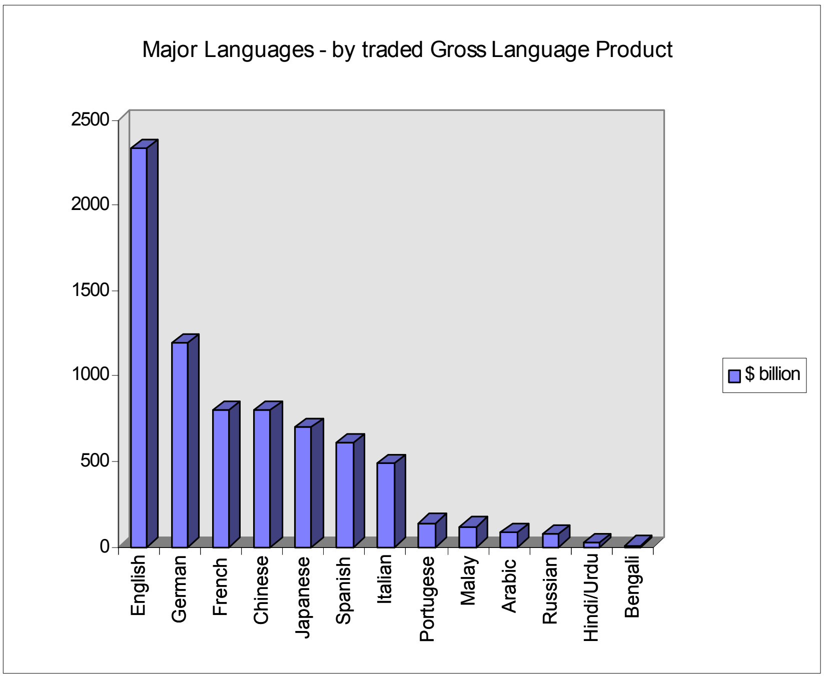
There is a direct analogy with plumbing. We turn on a tap and water comes out. We can have it hot, lukewarm or cold, delivered to a sink or a shower or by hose to a sprinkler in the garden. It requires no skill to use. But when the supply is interrupted, then we are totally at the mercy of the experts, the people who know about reservoirs, pumping stations, trunk mains, stopcocks, drainage, sewers. If we try to do our own plumbing, the likelihood is that we will end up with a flood that we can't stop. Right now on the Web, there are hundreds of thousands of amateur plumbers, and there are more in every big organisation, drowning colleagues in unnecessary e-mails. It's one of the biggest hidden costs that business faces today; in fact, a recent survey conducted by the British polling company Gallup and the Institute for the Future revealed that the average middle management executive sent 95 messages and documents, and received 83, each day, at a cost to their organisation of at least £6,000 per employee per year [11].

So what will happen? The Economist newspaper believes that, as far as the Internet is concerned, the established brands will emerge triumphant. "Because anybody can create a site on the Internet, everybody is hard to find," it points out. "So brands that are already really big have an enormous advantage, particularly among people coming online for the first time, who will tend to turn to names familiar from the real world." The article cites Disney, CNN and Time Warner as examples [12]. The argument makes sense, although the Web is building some new world brands - Yahoo! for example, which recently won the Best New Media award from the advertising industry magazine Marketing Week as the best recognised online brand in the world - beating not only Amazon.com but also the mighty AOL. But whatever dominant brands emerge, we can safely assume that managers will eventually use only what they know and trust, and return to their core business of managing.

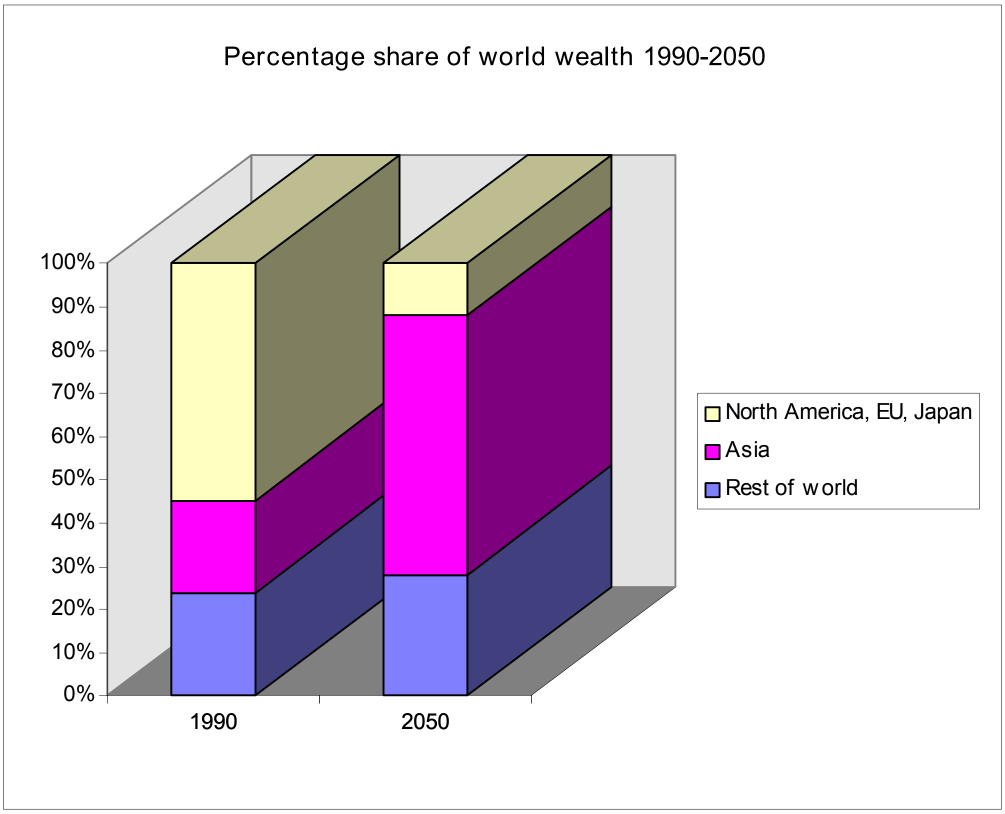
Does it always have to be English?

And overwhelmingly, the assumption is that, if this management is not being done in the local language - Czech, Hungarian, Romanian, Polish, German - then it will be done in English. English is the de facto world language - for the moment. But so complacent have English speakers become, that they seem to have fallen into the trap of assuming that this is how it will be for all time. Writing in the Financial Times recently, Brian Reading, a director of the financial analysis firm Lombard Street Research asserts that, the European single market and single currency will not work properly without a single language and that, as 42% of EU documents were originally written in English compared with 40% in French and only 6% in German, then English is the language that has to win [13]. But his argument carries the seeds of its own destruction. For he quotes an analysis of the hundred largest economies by size of gross domestic product, which shows that English is spoken by people who produce one third of the world's output, compared with 10% for Chinese speakers, 7% each for Spanish and German and 5% for French speakers. The trouble with this argument is that it is a cake that can be cut a large number of different ways, statistically speaking, and that it ignores the speed with which other developing economies will catch up with the English speakers over the next generation.

A recent report for the British Council, prepared by David Graddol and called The Future of English? [14], puts the language's economic importance in some long term perspective. Its argument goes like this: trade has always tended to be carried out in the customer's language; English speakers are currently the world's most active traders; but developing countries are increasing their wealth at a far faster rate than the English speakers, and in a generation, the share of world trade will look very different, with implications for language. The linguistic consequence of this, Graddol says, is that language popularity will tend to follow markets, and that the world status of a language depends less on gross domestic product than on the extend to which its native speakers trade their goods and services internationally. This is because, between 1950 and 1994, World Trade Organisation figures show that world trade multiplied 14 times while output rose only 5.5 times. So an increasing proportion of wealth is generated by trade, not production. From this, Graddol claims, it is possible to produce an economic model that calculates languages related to trade. The graph that this model produces is fascinating.



Firstly, it shows the enormously greater importance of German as a trading language on this measure, compared with Reading's rather crude measure of European Union bureaucratic output. In fact, the British Council report specifically points out that the use of German seems to be increasing in parts of central and eastern Europe, a trend that may be confirmed as more countries join the European Union. The implications for central European information entrepreneurs are crystal clear.



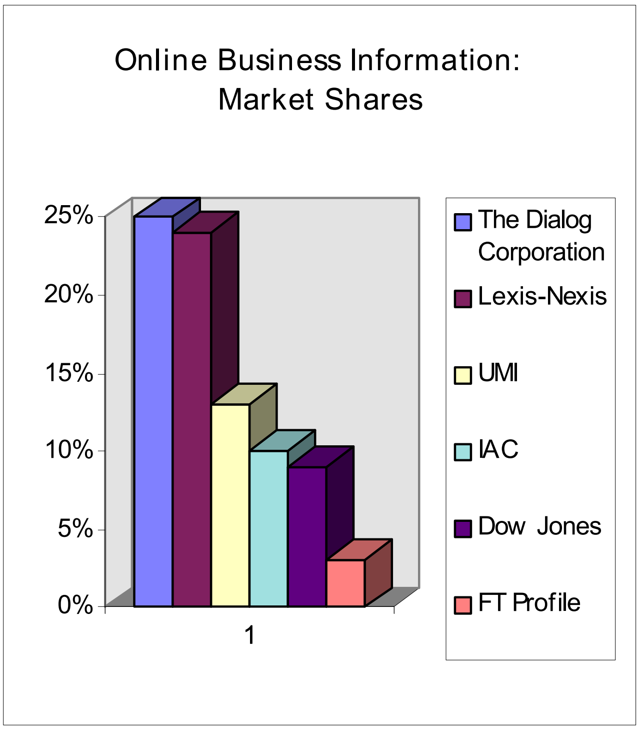
But that is in the short term. A generation on, the picture is much more cloudy. In 1990, just after the collapse of Communism in Czechoslovakia, the big three economic groups - North America, the European Union and Japan - regions with a very high percentage of English speakers - produced 55% of the world's wealth. Asia accounted for another 21% and the rest of the world, including the former Communist parts, got the remaining 24%. But by 2050, the report predicts, Asia will be producing 60% of the world's wealth and the rest of the world 28%, leaving the English speakers with only 12%. (This assumes 4% average annual growth worldwide.) Where will that leave English as a world language? Or German as a second language in this region?

The answer, of course, is that nobody really knows. Will Spanish become the most important language in America? If so, it won't be for the first time. In the Renaissance, Spanish was the international language that mattered, and English was just an also-ran. Will English remain the predominant second language in Asia, as it is now? Or will it be ousted by Chinese? Is Chinese a viable international language, bearing in mind its whole word rather than alphabetic structure? No-one knows. But there is no doubting China's rapidly increasing importance as a trading nation, nor that Chinese academics and dissidents are currently among the world's most enthusiastic adopters of the Web. Finally, two of the most comprehensively wired communities on earth - Singapore and Hong Kong - are both Asian, and both linguistic melting pots.

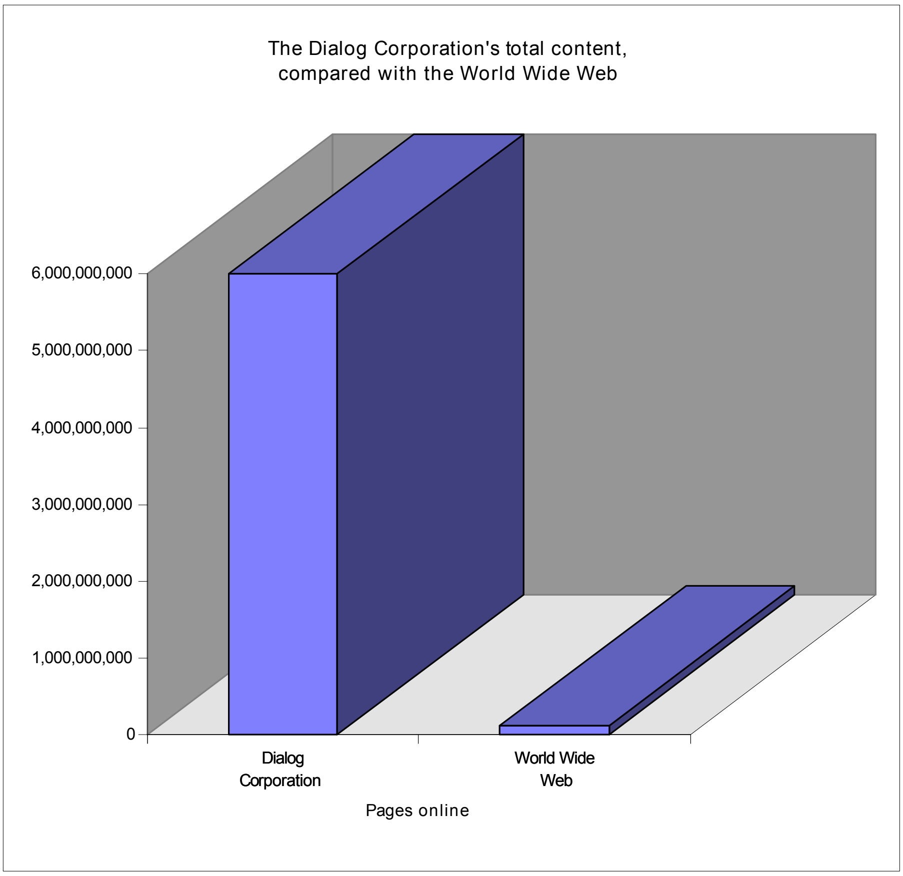
Think big - think dangerously

Maybe we don't have to worry about all this in the short term. We are here for three days of intensive study of the minutiae of the services that are our stock in trade - a very high percentage of them in English, I note. We're here to enjoy ourselves too, forging international friendships with people who all speak the same jargon - even if we don't all use the same language to do it in. We can compare and contrast content and search engines, networks and delivery channels. We can have fun grumbling about customers, ridiculing end-users and generally indulging in the sorts of activity that people of the same trade always do when they get together.

But we must never make the mistake of assuming that, because information happens to be at the top of everybody's agenda at the moment, this will always be the case. People are interested in information not because of the professional information services that are so important to us, but because of the World Wide Web. It is an information delivery medium of a kind, and it has raised awareness of online information. But wealth creators see its greatest potential in communication and commerce, not information delivery. We have a marvellous opportunity right now to persuade them of the value of this third application, and we must not let it slip away from us. And we have so much to offer - not just the Dialog Corporation, important though it is, but a whole raft of vibrant, healthy competitors.



The chart above shows what their market share looks like at the moment [15]. The Dialog Corporation is powerful, but not dominant - Lexis-Nexis runs it a close second. UMI and IAC occupy their own important niches. Will they all survive? Or do they represent the final flowering of the general purpose business information provider, destined to be cut down and scattered as powerful brands like Dow Jones or the FT decide to go it alone? In one sense, it doesn't matter. What does matter is this final dramatic graph.



On the left, the Dialog Corporation's pile of pages - about six billion of them, plus three million images. On the right, the entire contents of the World Wide Web - just one fiftieth the height of the Dialog Corporation's pile [16]. What's more, the Dialog Corporation's pile - and those of all its competitors as well - are neat and tidy, well labelled and efficiently indexed. The little pile on the right, as we all know, is a chaotic shambles. But none of this is any help to the embryonic information industries of central Europe if they can't afford either the information offered by commercial providers or the dial-up telecommunications costs of trawling the Web for information that they can afford. To grow this important market, to help it prepare for the entry into the European Union that is undoubtedly coming, and the greater prosperity that will in due course come with it, there is an obligation on information providers worldwide to agree the most generous deals they can afford - even if this means forgoing profits in the region until the millennium is well past.

The next issue of Business Information Review, which I edit jointly with your next speaker Barbara Buckley, carries an article by Dr Jiri Kadlecek, a leading Czech information consultant [17]. It tells a heroic tale of how Czech programmers and software developers honed their technological skills in the 1970s processing and analysing such science and technology information as the Communist regime would allow them to import from the west - on magnetic tape. He talks of the extraordinary restrictions that the regime put on online access to western databases in the 1980s - including, for example, an instruction " to modify search queries in order to confuse the enemy". And without pulling any punches, he speaks candidly about the problems that the Czech information industry faces at the moment. The coming of the millennium must be eagerly awaited here, for example, if only because it marks the end of the monopoly enjoyed by Czech Telecom with its "horrible network", as Dr Kadlecek describes it.

Another key problem is the cost of information. Dr Kadlecek points out that the gross national product per capita of the Czech Republic is currently only about 55% of the European Union average. Of course it will come on by leaps and bounds. Forecasts published in the Financial Times last December [18] show 4.5%-5.5% growth in the Czech Republic's gross domestic product in 2000 and 5%-6% in 2001, and this is set against a declining inflation rate - from a projected 8%-9% this year to 4%-5% in 2001. These are good omens. But we in the western information industry can help our colleagues in the Czech Republic make them even better. Dr Kadlecek is quite clear about the best pricing model for online at the moment - pay-as-you-go. Because of the low and unpredictable frequency of searches, pay-as-you-go, preferably on a deposit basis, avoids the high banking fees associated with transfers of multiple low amounts of money. Subscription access, he makes clear, is not currently welcome.

Ladies and gentlemen, there are quite a number of western information company representatives here and, to judge from the titles of their papers, some of them are looking to do a fairly hard selling job. That's fine! But you must expect a searching and critical response from an audience with long experience of careful and discriminating purchasing. So I ask every western commercial information provider here not to leave this country until they have each given some undertaking to set a pricing model that reflects current Czech purchasing power compared with that of the west. The profits will come in due course, believe me. But right now, let us in this industry, of which we are all so proud, show in a practical way that we care about democracy and freedom. Thank you.

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