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STRATEGIC MARKET PERSPECTIVE

Multimedia – Implications for Business Integrators

Business Integration Programme – Europe

DECEMBER 1994

Multimedia – Implications for Business Integrators

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Germany
Tel. +49 (0) 6447-6055
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London
Cornwall House
55-77 High Street
Slough, Berkshire SL1 1DZ
Tel. +44 (0)1753 530444
Fax +44 (0) 1753 577311

New York
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
U.S.A.
Tel. 1 (201) 801-0050
Fax 1 (201) 801-0441

Paris
24, avenue du Recteur Poincaré
75016 Paris
France
Tel. +33 (1) 46 47 65 65
Fax +33 (1) 46 47 69 50

San Francisco
1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel. 1 (415) 961-3300
Fax 1 (415) 961-3966

Tokyo
Saida Building, 4-6,
Kanda Sakuma-cho
Chiyoda-ku, Tokyo 101
Japan
Tel. +81 3 3864-0531
Fax +81 3 3864-4114

Washington, D.C.
1953 Gallows Road
Suite 560
Vienna, VA 22182
U.S.A.
Tel. 1 (703) 847-6870
Fax 1 (703) 847-6872

Abstract

This report examines the development and implementation of multimedia technologies and subsequent implications for vendors of business integration services.

The report:

- Analyses both vendors' and users' attitudes towards the utilisation of multimedia
- Examines which vertical markets are early adopters of multimedia technologies
- Examines which business processes are benefiting from multimedia enriching technology
- Identifies areas of required key competency for vendors and prospective vendors
- Discusses recent developments on the supply side of the marketplace in terms of mergers and alliances, joint ventures and partnership initiatives.

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Table of Contents

I	Introduction	I-1
	A. Objectives	I-1
	B. Scope and Methodology	I-2
	C. Report Structure	I-3
	D. Related Reports	I-3
II	Executive Overview	II-1
	A. Multimedia is Supply Led and Investment Driven	II-1
	B. Project Opportunities for Business Integration Vendors are Limited	II-2
	C. The Arrival of "Content" will Drive the Second Wave of Multimedia	II-4
	D. Integration Vendors can Participate in the Second Wave	II-6
III	Marketplace Developments	III-1
	A. The End of the First Wave of Multimedia Development	III-1
	B. There is no Market or Industry called Multimedia — but there are Opportunities	III-3
	C. Alliances are Key to Success	III-4
	1. Microsoft	III-5
	2. British Telecommunications	III-6
	3. Oracle	III-7
	D. The Second Wave of Alliances-—with Content Providers	III-7
IV	User Views	IV-1
	A. Users "Talk the Talk", but do not yet "Walk the Walk"	IV-2
	B. Multimedia Implemented by Half of Respondents	IV-5
	C. "Followers" Remain to be Convinced	IV-7
	D. Multimedia Predominately Used in Presentation-based Applications	IV-9

E. Users are Using External Companies to Develop Multimedia Systems IV-11
F. "Evolving" Equipment Manufacturers are well Placed to Implement Multimedia IV-13

V Vendor Views V-1
A. Vendors View Multimedia as a Long Term Opportunity V-1
B. Supply-side Push Currently Defines the Marketplace V-2
C. Video-conferencing is Regarded as a Key Technology V-4
D. Retailers Drive Early Adoption of Multimedia V-5
E. Traditional Systems Integration Skills will Remain Important V-7

A User Questionnaire V-1
B Vendor Questionnaire V-1

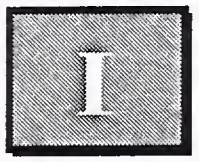
Exhibits

I		
-1	Profile of Respondent Base (Europe)	I-2
II		
-1	Implemented Multimedia Technology	II-2
-2	User Spending on Multimedia in France, Germany and UK	II-3
-3	New Players Possess Powerful Brands	II-5
-4	Multimedia Alliance Map	II-6
III		
-1	Phases in Research and Technological Development, Industry Attention and Revenues	III-1
-2	Sectors Adopting Multimedia Technology	III-2
-3	Key Supply Side Alliances	III-5
-4	New Market Entrants	III-8
IV		
-1	Profile of Respondent Base (Europe)	IV-1
-2	User Definitions of Multimedia	IV-2
-3	Multimedia Technologies Being Utilised	IV-4
-4	Multimedia Qualities	IV-4
-5	Reasons for Non-implementation	IV-5
-6	Implementation of Multimedia in Last Year	IV-6
-7	French, German and UK Implementation of Multimedia in Last Year	IV-7
-8	Intention to Implement Multimedia over the Next Two Years	IV-8

-9	French, German and UK Multimedia Implementation Intentions	IV-9
-10	Implemented Applications of Multimedia	IV-10
-11	Cost Analysis of Multimedia Development and Implementation	IV-11
-12	Average User Spend on Multimedia by Country	IV-12
-13	User Views of Vendors, Capability to Implement Significant Multimedia Projects – Europe	IV-14
-14	User Views of Vendors, Capability to Implement Multimedia	IV-15
-15	User Views of Vendors, Capability to Implement Significant Multimedia Projects – Germany	IV-16

V

-1	Multimedia Implementation and Revenues	V-1
-2	Vendor Definitions of Multimedia	V-3
-3	Multimedia Technologies Used	V-4
-4	Industry Sectors Using Multimedia Technologies	V-6
-5	Business Processes Using Multimedia Technologies	V-6
-6	System Integration Qualities Relevant to Multimedia Implementation	V-7



Introduction

A Objectives

Multimedia has, over the last year, become a topic of universal concern arousing the interest of major organisations from industries as diverse as telecommunications, entertainment, software and publishing, as well as from the traditional Information Technology (IT) industry.

Investment levels unseen by companies' R&D departments for a decade are being directed at multimedia initiatives in a desperate race to find killer commercial and consumer applications

However, the market is simultaneously widely perceived as a zero billion dollar opportunity one, where exaggerated talk and wild promises are unsubstantiated by revenues and profits and where expectations are roundly exceeding reality.

The aim of this report is to assist vendors of IT-related systems integration services to:

- Identify project service opportunities arising out of the adoption of multimedia technology
- Understand the different adoption timescales of multimedia-enriched applications in early adopting and massdeveloping markets
- Identify areas of required key competency for vendors and prospective vendors
- Focus on processes which will utilise multimedia technologies
- Analyse the application of multimedia in existing systems integration (SI) contracts
- Examine the strategies of lead vendors of multimedia technology and related services.

B
Scope and Methodology

The report analyses responses from users and vendors of multimedia technologies to questionnaires which are attached in Appendix A and B.

From the user community there were 60 respondents to the questionnaire, split evenly between France, Germany and the UK.

Within the vendor community questionnaires from 15 vendors of business integration (BI) services were analysed. These responses were supplemented by face-to-face interviews with five vendors to discuss and clarify specific issues, gain both a high level and detailed view of vendor's initiatives, and understand BI vendors' strategic plans for alliances, joint ventures and partnership-based multimedia-related operations.

Exhibit I-1 provides a profile of the sector breakdown of user respondents across Europe.

Exhibit I-1

Profile of Respondent Base (Europe)

	Percent
Government	24
• Central	10
• Local	14
Financial Services	21
Manufacturing	40
• Discrete	25
• Process	15
Retail	10
Telecommunications	5

Source: INPUT

C
Report Structure

Chapter II consists of the Executive Overview which is a summary of the key conclusions of the study.

Chapter III is an overview of multimedia-related developments on the supply of the marketplace which sets the context for the following chapters.

Chapter IV contains details of users' views of implemented multimedia technologies.

Chapter V contains details of business integrators' views of multimedia related developments.

D
Related Reports

Procurement Approaches to Systems Integration, 1993

Key Applications that Drive SI Projects — Europe, 1993-1998

Systems Integration Market — Europe, 1993-1998

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II

Executive Overview

A
Multimedia is Supply Led and Investment Driven

The widespread hype and resulting confusion that the multimedia technology has aroused is based both on a mistaken desire to identify a tangible "multimedia industry", and a failure to discern differences between potential applications in the long term and realistic applications available and currently being implemented.

Speculation regarding multimedia has generated enormous excitement and wild extrapolations of a revolution in the way technology is applied to people's lives, affecting fundamental changes in the way people work and pursue leisure.

A more realistic vision of what multimedia is, and will mean in both consumer and business markets has emerged in the second half of 1994, primarily focused through the prism of hard data concerning the actual sales of multimedia equipment and applications.

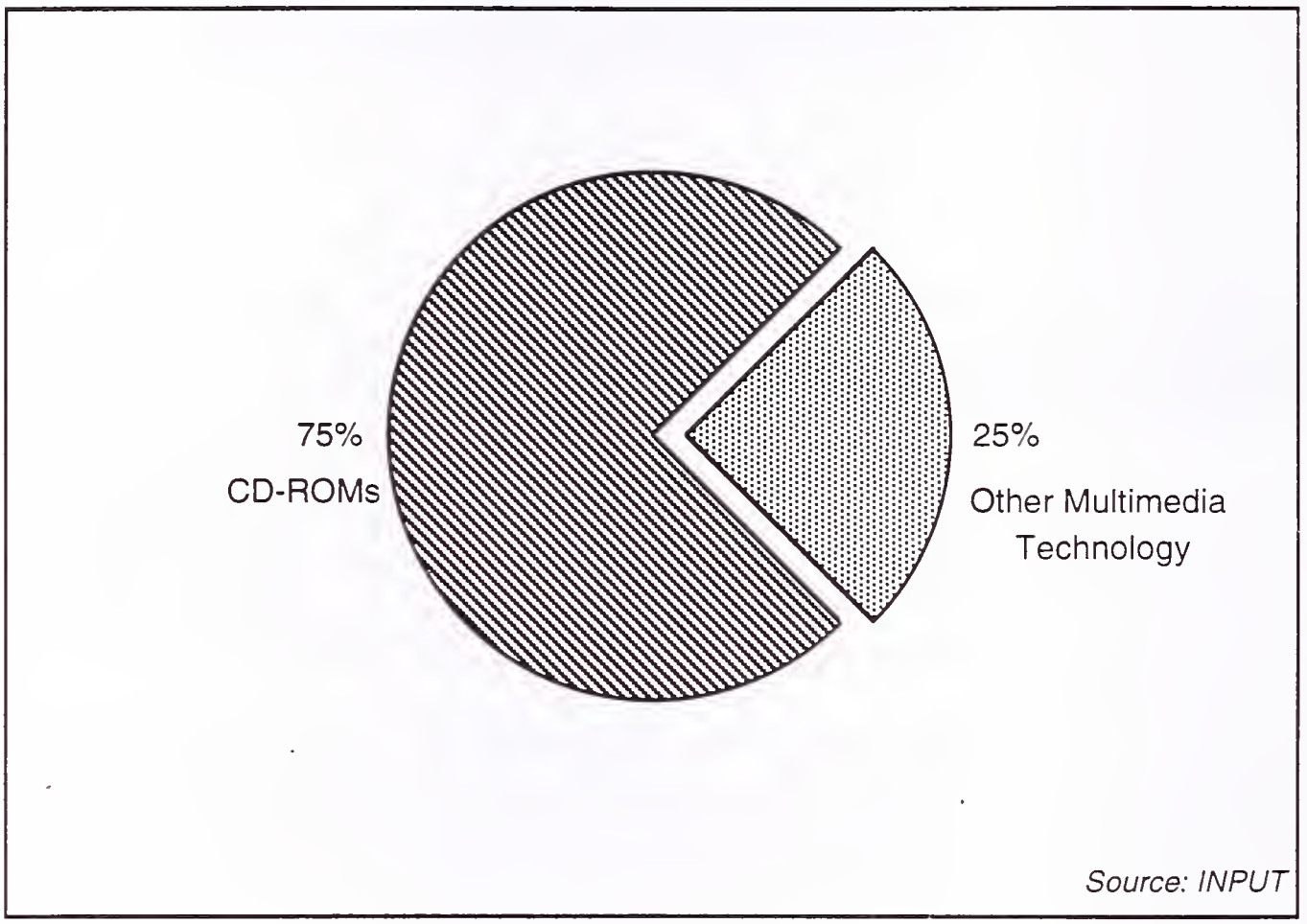
It has become clear that research and development costs are prohibitively high. Microsoft is spending $120m per year on Information Superhighway-related research designed to support multimedia applications. Revenues generated by multimedia are still extremely small and the timeline for significant marketplace adoption of technologies such as video-on-demand or full-motion PC-based video is the medium to long term.

Multimedia in reality means CD-ROMs

Multimedia is still to all intents and purposes a localised, stand-alone, non-interactive software tool. When asked what multimedia technologies were being utilised in their organisations more than 75% of respondents were found to be using CD-ROMs, as shown in Exhibit II-1. Other technologies such as those mentioned above, video-conferencing and point-of-sale kiosks, were mentioned by both users and vendors but the marketplace for these nascent technologies is extremely immature.

Exhibit II-1

Implemented Multimedia Technology



B
Project Opportunities for Business Integration Vendors are Limited

There are currently limited opportunities for vendors of business integration services to benefit from the implementation of multimedia.

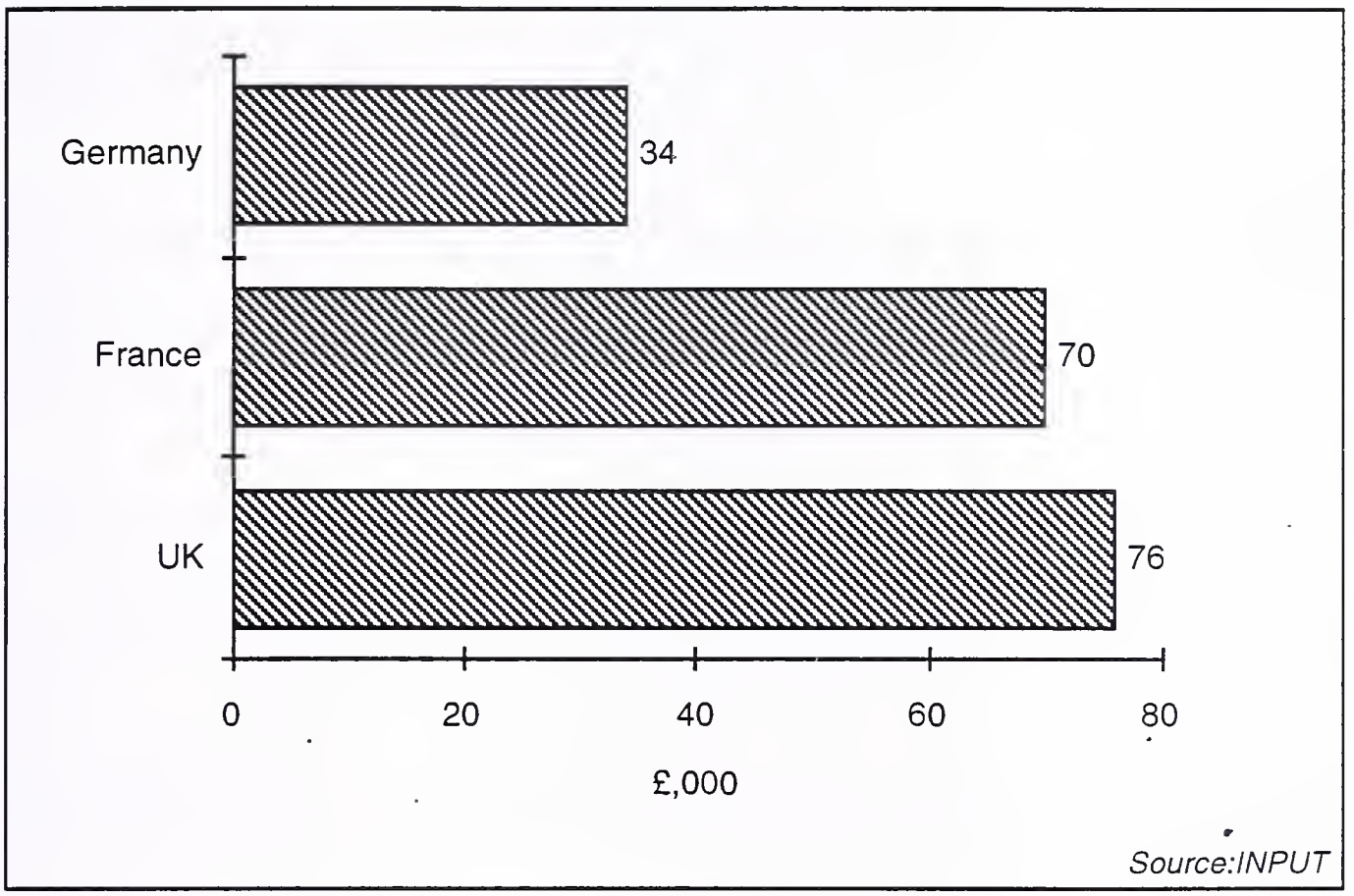
CD-ROMs and their associated software drivers are merely tools which are used as any other piece of software, such as a spreadsheet or database, and do not in themselves generate integration or professional services engagements in user organisations.

Networked full-scale multimedia will undoubtedly present Business Integration (BI) vendors with development, implementation, and integration opportunities in user environments. But these types of opportunity, large enough to warrant the use of outside BI vendors, will not occur until 1997 at the earliest.

Exhibit II-2 provides an analysis of average user spend on multimedia in France, Germany and the UK. Average user spending on multimedia technology is under £80,000.

Exhibit II-2

User Spending on Multimedia in France, Germany and UK



Vendors are aware, however, of the need to have some form of presence in the early stages of marketplace development to maintain both a technical currency and develop an ability to respond to client requirements at the earliest opportunity.

This presence is being created through hardware and software-related research and development and through a limited deployment capability.

Vendors are currently unable or unwilling to produce details regarding revenues or potential revenues being generated by present or future implementation of any form of multimedia technology.

Anecdotally, vendors are able to supply outlines of investment budgets and predicted research and development spend but when pressed to supply or estimate actual revenues they are unable to respond.

Users of multimedia are similarly hesitant in producing details of implementation in their organisations in terms of actual spending. User research however shows that:

- Fifty per cent of respondents claim to have implemented some form of multimedia technology over the last year.

- France is currently the leading country in the adoption of multimedia technologies. Over 70% of respondents have implemented some form of multimedia in the last year.
- There is a significant proportion of users which remains to be convinced of the need to acquire multimedia technologies, even at the low-cost CD-ROM level.

C
The Arrival of "Content" will Drive the Second Wave of Multimedia

Late 1994 marks the end of the "first wave" of multimedia development. The deluge of media interest in multimedia over the last 18 months has now been replaced by a reaction against it.

One of the most important developments in the *second wave* of multimedia development will be the increasing role and profile of new market entrants from a wide diversity of backgrounds, most significantly from *content* production and its distribution.

These new *content* players possess widely recognised brands, significantly more powerful than those belonging to traditional IT providers.

In the complex and confusing world of the Information Superhighway, these brand qualities will be extremely influential in guiding and helping people through the forest of information which full on-line, interactive digital technology will undoubtedly produce.

Exhibit II-3 shows some of the major brands now entering the multimedia environment.

Exhibit II-3

New Players Possess Powerful Brands

Sector	Company
Publishing	Reed Elsevier
	Daily Telegraph Group
	Bertlesmann
	Associated Newspapers
Broadcasting	British Broadcasting Corporation
	Canal +
	News International
Retail	Thomas Cook
	WH Smith
	Argyll
Airlines	Virgin
	United Airlines
	British Airways

Source: INPUT

Companies such as Reed Elsevier, with their recent acquisition of the US-based publisher Mead Corporation, are now a leading international publisher with a recently expressed aim of generating 50% of revenues through electronic publishing. The strength of their content and the power of their brands, i.e. their magazines and books, provides them with powerful collateral and leverage in consumer and business user environments.

BI vendors who have been cautious in their approach to joint-venturing and partnering in the early stages of multimedia should carefully study opportunities to become more aggressively involved with these businesses, and process-orientated, non-technology-led players. Service opportunities will exist around the delivery of these new forms of content.

D
Integration Vendors can Participate in the Second Wave

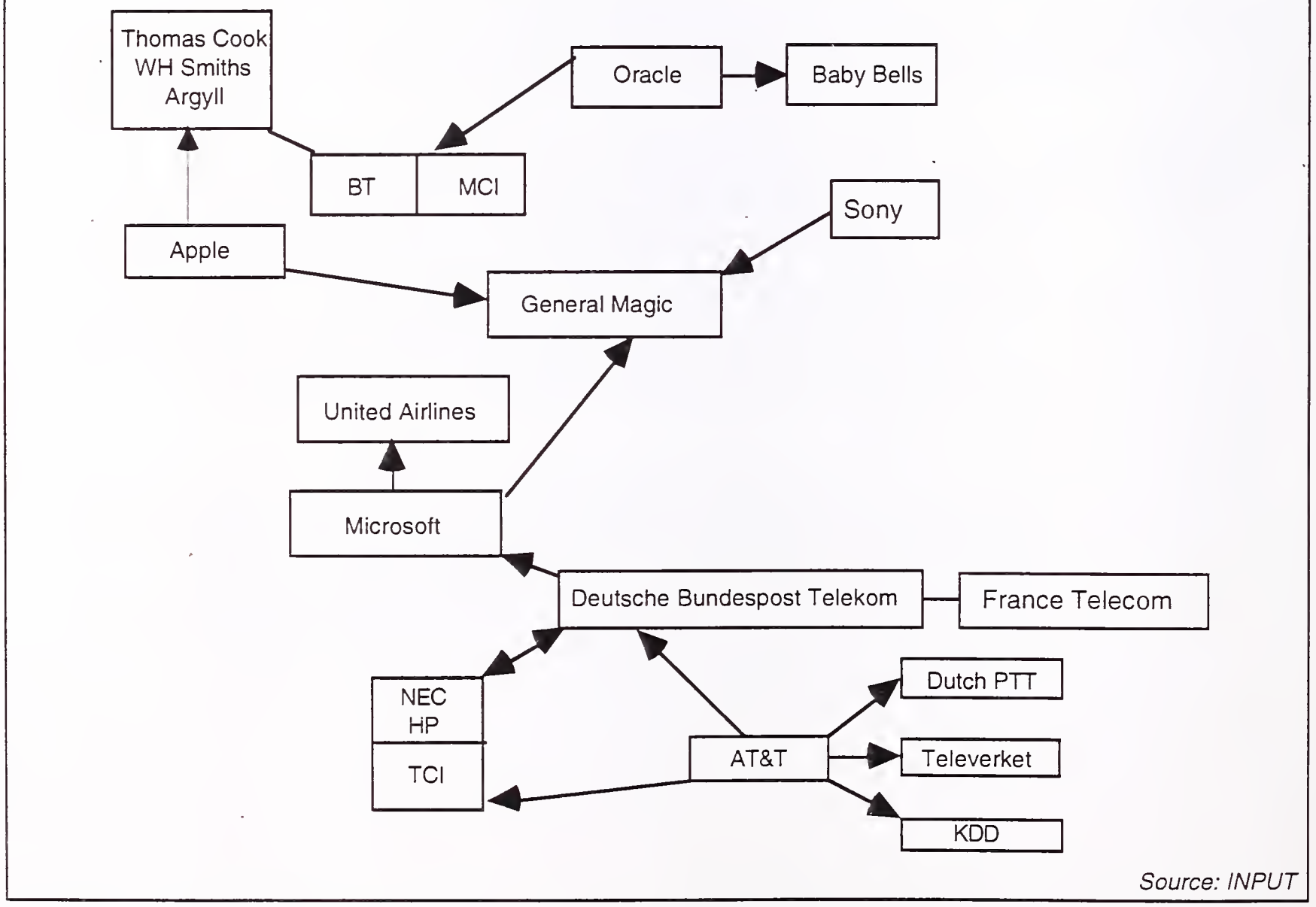
The business integration divisions of IT-equipment oriented vendors have so far adopted a watching brief on developments within multimedia. Although their "parent" organisations in many cases are investing significant sums in the development of hardware and software, the integration business has remained distant from the process. The same is true, with a number of notable exceptions, in terms of the development of alliances, joint ventures, or partnership arrangements.

Professional services vendors and integrators with a software house background have behaved in a similar fashion.

The map of alliances involving multimedia, as shown in Exhibit II-4, has become extremely complex and shows no signs of becoming less so.

Exhibit II-4

Multimedia Alliance Map



Source: INPUT

The high level of merger and acquisition activity, and perhaps more importantly, of partnering activity, has been driven by the complexities of many of the issues involved in developing and bringing to market multimedia technologies, not least in the development of standards. the lack of which is presently acting as an inhibitor in the marketplace.

Convergence has driven frenzied merger, acquisition and alliance activity that is currently altering the shape of the large project service market: new and different value chains are emerging through the convergence of different companies, markets, and sectors.

BI services vendors need to be aware of the implications of these developments on their access to both traditional and new marketplaces.

Blank

III

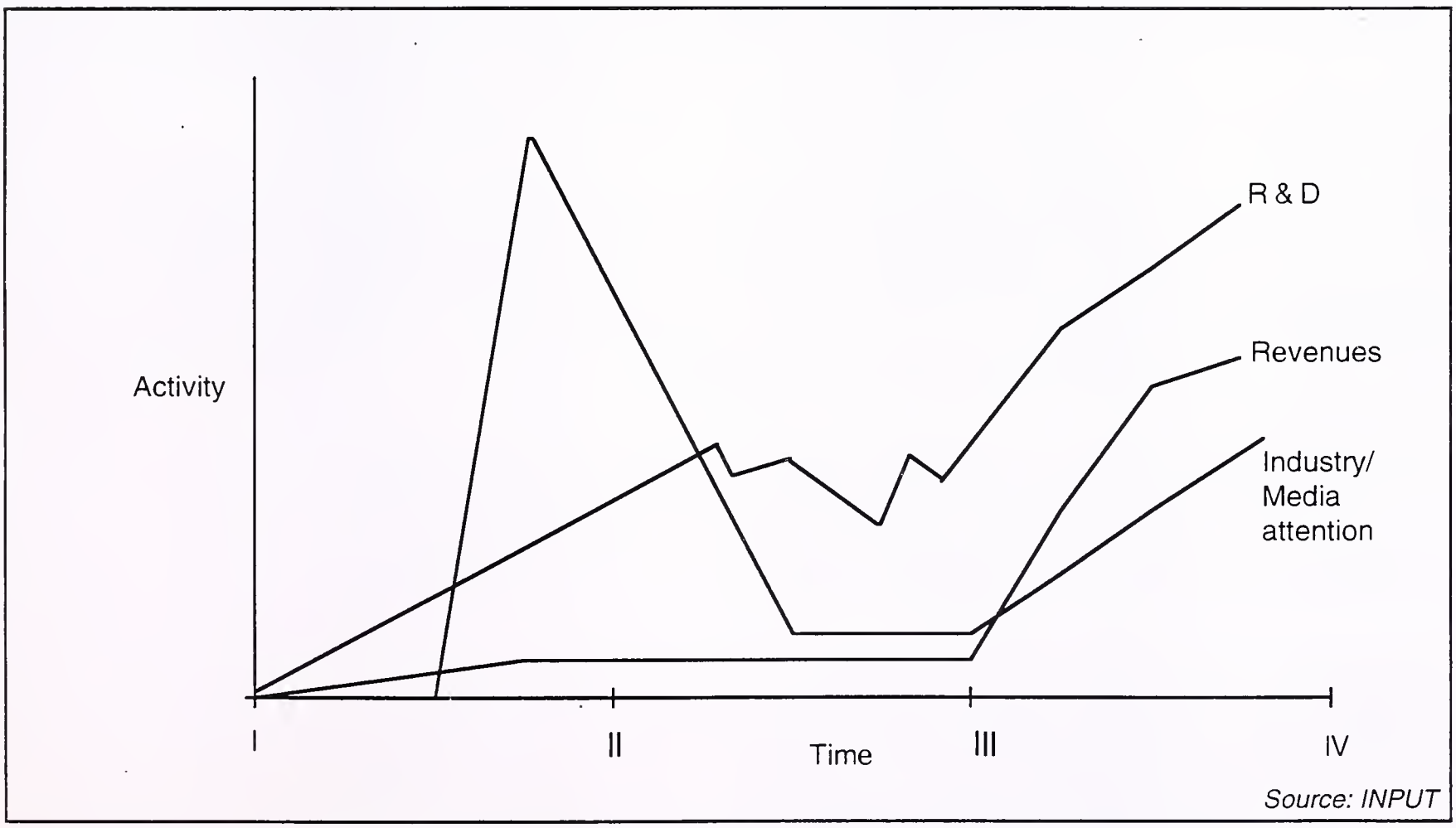
Marketplace Developments

A
The End of the First Wave of Multimedia Development

Late 1994 marks the end of the "first wave" of multimedia development. The deluge of media interest in multimedia over the last 18 months has now been replaced by a reaction against it. This understandable and not-unexpected development is the result of the reality of multimedia having been found wanting. Exhibit III-1 presents a generic model of phases in research and development, industry interest and revenues which is applicable to the development of multimedia.

Exhibit III-1

Phases in Research and Technological Development, Industry Attention and Revenue



Speculation has generated enormous excitement, which in turn has generated wild extrapolation, promising a revolution in the way technology is applied to people's lives and subsequently in the way people live. Technologists, anthropologists and marketeers have all talked of a brave new world in a way that Aldous Huxley or H.G. Wells, who first promulgated the Information Superhighway in 1936 with his idea of a World Brain repository of all human knowledge, would have recognised.

There is a human instinct to believe that the world starts afresh in the future, that the future starts not from where we are but from where we would like to be; to believe that things will be different tomorrow. Sober reflection brings the more staid view that they seldom are, that change is incremental, and that new technologies are embraced within the structures of commerce and life through evolution rather than revolution.

But these romantic and unrealistic "future watch" scenarios are being eroded by a new reality focused through the prism of hard numbers. It has finally been realised that research and development costs, are prohibitively high.

However, developments in multimedia both from a technological point of view and in terms of technology utilisation will not cease now that the media's spotlight is moving elsewhere.

Although multimedia's capabilities are still beyond the interest horizons of many, the chromosomes of the marketplace and the future shape of the delivery side of the market is presently being configured.

Convergence is driving frenzied merger, acquisition and alliance activity that is currently altering the shape of the large-project service market; new and different value chains are emerging through the convergence of different companies, markets, and sectors. Service vendors need to be aware of the implications of these developments in their access to both traditional and new marketplaces.

B

There is no Market or Industry called Multimedia — but there are Opportunities

The widespread hype and resulting confusion that multimedia has aroused is based both on a mistaken desire to identify a tangible "multimedia industry", and a failure to discern differences between potential applications in the long term and realistic applications available and being implemented now.

Many business processes and their enabling applications which have been the source of project services opportunities are being, and will increasingly be, affected and altered by the utilisation of multimedia technologies.

Exhibit III-2 provides details of early adopting marketplaces. Business integrators should focus on these early adopting sectors such as financial services, the travel and retail industries and process manufacturing and should adopt suitably pro-active marketing approaches in these marketplaces.

Exhibit III-2

Sectors Adopting Multimedia Technology

Sector	Application
Financial Services	Banking Booths
Travel Retail	Multimedia Workstations
Fashion Retail	Tailoring/Ordering Booths
Manufacturing	On-line Diagnostics

Source: INPUT

In the banking arena vendors, including British Telecom and Oracle, are working with a consortium of UK and overseas banks to develop "banking booths" where customers will be able to transact business through video and on-line access to accounts from railway stations and out-of-town supermarkets as well as in banks themselves.

In the travel agency business, CGS have recently begun shipping Vogue, a multimedia travel agency workstation which enhances a travel agents ability to present details of holiday and travel locations through video and stills images, timetables pulled from on-line databases and on-line booking – all driven through a voice recognition menu system.

A number of leading retailers in the United Sates and in the UK are putting in place multimedia access for in-store use and in opening up home shopping TV channels. Multimedia booths will allow customers to see videos of fashion shows, order clothes, discuss tailoring alterations in real-time and pay through a credit card transaction.

C
Alliances are Key to Success

The alliance map is complex and shows no signs of becoming less so. The high level of merger and acquisition activity, and perhaps more importantly, of partnering activity, is being driven by the complexities of many of the issues involved in developing and bringing to market multimedia technologies, not least in the market-inhibiting factor of standards.

Many vendors are striding purposefully into this process with conviction and belief in their strategy and chosen tactical direction. Others are standing less assuredly to one side, aware that a wrong bet today may mean a lost fortune tomorrow but mindful of the fact that IBM was not even aware it was making a bet when it licensed MS-DOS from Microsoft Corporation. The less charitable view of the former camp is that bets are being hedged through buying into anything and everything.

Exhibit III-3 presents details of three key alliances which are emerging within the market's supply side and highlights the leading players within these powerful alliances.

Exhibit III-3

Key Supply Side Alliances

Microsoft	NEC
	Hewlett Packard
	Deutsche Bundepost Telekom
	General Magic
British Telecom	MCI
	Oracle
	Apple
Oracle	British Telecom
	Baby Bells

Source: INPUT

1. Microsoft Corporation

Microsoft Corporation is attempting to leverage its strength on the desktop into the "new" desktop and home-based related multimedia market. Microsoft is joint-venturing with Deutsche Bundpost Telekom, Hewlett Packard and NEC on the development of video server software presently named Tiger, which is a Windows-based system for the operation of television-based decoder boxes. This system will allow ordinary televisions to be used for interactive games and interactive home shopping.

Microsoft is also developing Mmosa, Multimedia Operating System Architecture, in conjunction with a small US-based equipment manufacturer, Integrated Systems, for tests of interactive television, being run by the large network operator TCI on the west coast of the United States of America.

Involvement with TCI has brought Microsoft into development contact with General Magic, the IBM/Apple/Sony joint venture, and with AT&T. General Magic is developing "electronic agent" or "digital assistant" programs which will extract information from networked electronic databases according to a user's interest sets, and refine those interest sets through a "learning interaction" with the user.

AT&T, in conjunction with TCI, is establishing PersonaLink, a system within their managed network which allows for the utilisation of these networks.

Microsoft are also developing this technology to be utilised on Marvel, their soon to be launched on-line information database.

The complexities of the nascent marketplace however have been illustrated by Vincent Grosso, who leads AT&T's interactive TV test in Chicago who commented recently that it is "hard work deciding what AT&T will do in this business".

2. British Telecom

British Telecom is at present arguably the most active telecommunications player in the worldwide multimedia market. Unarguably it is the most active in Europe.

This interest in multimedia-related development is being driven by a realisation that multimedia offers the company the opportunity to fulfil its ambition of becoming a leading worldwide information services provider, firmly establishing itself outside of its historical national market and role of purely being a telecommunications carrier.

In head-to-head confrontation with the leading American Telcos BT must be able to compete aggressively in the next wave of de-regulated market maturity which multimedia represents.

BT's much heralded postponement until mid-1995, at the earliest, of large scale interactive TV trials is a serious blow. However, placed in the context of postponed trials by amongst others Time Warner in the US, BT's setback may perhaps give less cause for concern.

British Telecom's Video-on-demand (VOD) plans are undoubtedly aggressive and optimistic. Its business plan for VOD aims at a marketplace adoption rate that would be four times faster than that for the take-up of satellite TV dishes, which have been the fastest-selling consumer electronics item ever launched.

Geoffrey Roman, Head of Technology at equipment manufacturer General Instruments, has claimed that even if VOD captures 50% of the video rental store business, network builders such as BT will not break even on this initiative for 17 years.

BT are working closely with one of AT&T's major rivals, MCI, in the 1995 trials and will be utilising both hardware and software, jointly developed with Apple, Oracle, nCube and Alcatel-Alsthom.

3. Oracle

Oracle is the driving force behind the Desktop Alliance which has as partners not only BT but many of the leading US-based Baby Bells who are aggressively playing in US markets and increasingly in Europe.

Similarly to Microsoft, Oracle is attempting to extend its dominance of the systems database market into what it considers is the complementary offering of video servers and management systems for the large databases needed for applications such as video-on-demand.

D
The Second Wave of Alliances — with Content Providers

One of the most important developments in the *second wave* of multimedia development is the increasing role and importance of vendors from content and distribution backgrounds on the supply-side of the marketplace. Exhibit III-4 demonstrates the diversity of background of these new players.

Exhibit III-4

New Market Entrants

Sector	Company
Publishing	Reed Elsevier
	Daily Telegraph Group
	Bertlesmann
	Associated Newspapers
Broadcasting	British Broadcasting Corporation
	Canal +
	News International
Retail	Thomas Cook
	WH Smith
	Argyll
Airlines	Virgin
	United Airlines
	British Airways

Source: INPUT

These new market entrants are likely to be the significant force in driving the growth of the marketplace in the medium term. It is the content, in the shape of television programmes, interactive activities and home shopping, being distributed through multimedia channels which will provide the still unidentified "killer applications" to subsequently drive mass market adoption.

Paul Allen, co-founder of Microsoft Corporation, and now a major investor in a raft of multimedia-related development companies, has posed the question of what new applications, user interfaces, products and services will be developed which will find mass market acceptance. For every multimedia success story (CD-ROMs) there are already spectacular failures, such as Personal Digital Assistants (PDAs).

It is also in this arena that the primary unknown variable of social factors, i.e. people and their behaviour, will be most keenly realised. Predicting human behaviour and the acceptance of goods, services, thoughts, lifestyles and patterns of action, is clearly a complex task and one that due to that complexity is often wilfully overlooked.

Marketers and technologists prefer to follow a simplified, reductivist view of marketplace acceptance much in the way that historically marketers and technologists always have done. One need only think, however, of the mass rejection of, for example, the Post-Modernist Bauhaus-based view of housing in favour of the more commonly-held idealised vision of the British family home as a Georgian townhouse or Elizabethan cottage, to be aware of the unpredictability of human behaviour. No pre-war future watchers made that prediction.

The second wave of multimedia will be driven by content; people buy videocassette recorders to watch films, not to buy videocassette recorders. The market subsequently has lately witnessed a flood of new entrants from content backgrounds.

Reed Elsevier, recently expressed the aim of generating 50% of revenues through electronic publishing. The Readers Digest publishing group is using its collateral to develop electronic versions of their magazine with Microsoft.

The same logic applies to the British Broadcasting Corporation which is, now offering its own bulletin boards and access channels through the Internet. Many of the major news publishers, such as News International and the Daily Telegraph group, are offering on-line versions of their daily papers. These developments offer "added-value" service opportunities to be provided from the base service offering.

In the retail sector, major players such as W.H Smith & Son Ltd, Argyll, and Thomas Cook are participating with British Telecom to explore ways of offering on-line shopping, ordering and delivery of goods.

In the airline industry Virgin, United Airlines, and British Airways are all exploring on-board on-line services and other multimedia services.

These new content players possess stronger, broader, more widely recognised brands that traditional IT providers. Telecommunications vendors also have "better" brands than IT players. Microsoft has belatedly recognised this and is aggressively pursuing brand name led advertising.

In the complex and confusing superhighway, these qualities will be more important than ever in guiding and helping people through the forest of information. These qualities must, however, be as sophisticated as retailers and broadcasters currently employ. Retailers, for example will not consider this avenue until design and packaging produce leverage in the way they do presently. The quality of the interface will be key.

BI vendors who have been cautious in their approach to joint-venturing and partnering in the early stages of multimedia development should carefully study opportunities to become more aggressively involved with these business, and process-orientated, non-technology-led players. Service opportunities will exist around the delivery of these new forms of content.

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IV

User Views

This chapter analyses responses from users of multimedia to the questionnaire which is attached in Appendix A.

Exhibit IV-1 provides a profile of the sector breakdown of respondents across Europe.

Exhibit IV-1

Profile of Respondent Base (Europe)

	Percent
Government	24
• Central	10
• Local	14
Financial Services	21
Manufacturing	40
• Discrete	25
• Process	15
Retail	10
Telecommunications	5

Source: INPUT

There were 60 respondents to the questionnaire, split evenly across the UK, Germany and France. It should be noted that the response rates for this survey were significantly lower than is the case in the majority of INPUT's questionnaire-based research, indicating low overall adoption rates.

A
Users "Talk the Talk", but do not yet "Walk the Walk"

As with many immature technologies, there are currently no clear definitions of exactly what multimedia is and is not.

In terms of undertaking this research INPUT was interested in gathering definitions from users in an attempt to:

- Understand users' views of what multimedia means
- Provide interested parties from both the supply and the demand side of the industry with a set of common terminology.

The research highlights an interesting gap between users' understanding of multimedia's potential and their pragmatic utilisation of it in business in 1994.

Exhibit IV-2 shows a summary of the most commonly expressed definitions of multimedia. These closely dovetail the terminology and type of language used by vendors and reported in the general, business and IT-specific press (see Exhibit IV-2).

Exhibit IV-2

User Definitions of Multimedia

- On-line distribution of mixed media
- Interactivity
- Mixed media, available locally and remotely
- Integrated use of IT and communications

Source: INPUT

This can be read as a comment on the enormous amount of coverage, hype and speculation that there has been surrounding multimedia and especially the so-called Information Superhighway over the last 18 months.

Every serious national newspaper now has an on-line section or a "How I learned to stop worrying and love the Internet" feature on a regular basis. The trade press have been presented with an opportunity to refocus its interests away from the non-newsworthy discussion of legacy technologies which they have seized with a vengeance.

Permeating throughout the whole of this information overload is the drip-feed of marketing led data which informs and dictates the agenda to which journalists and commentators so eagerly subscribe. The journalists' pack mentality, otherwise known in business terms as critical mass, has been in full flow.

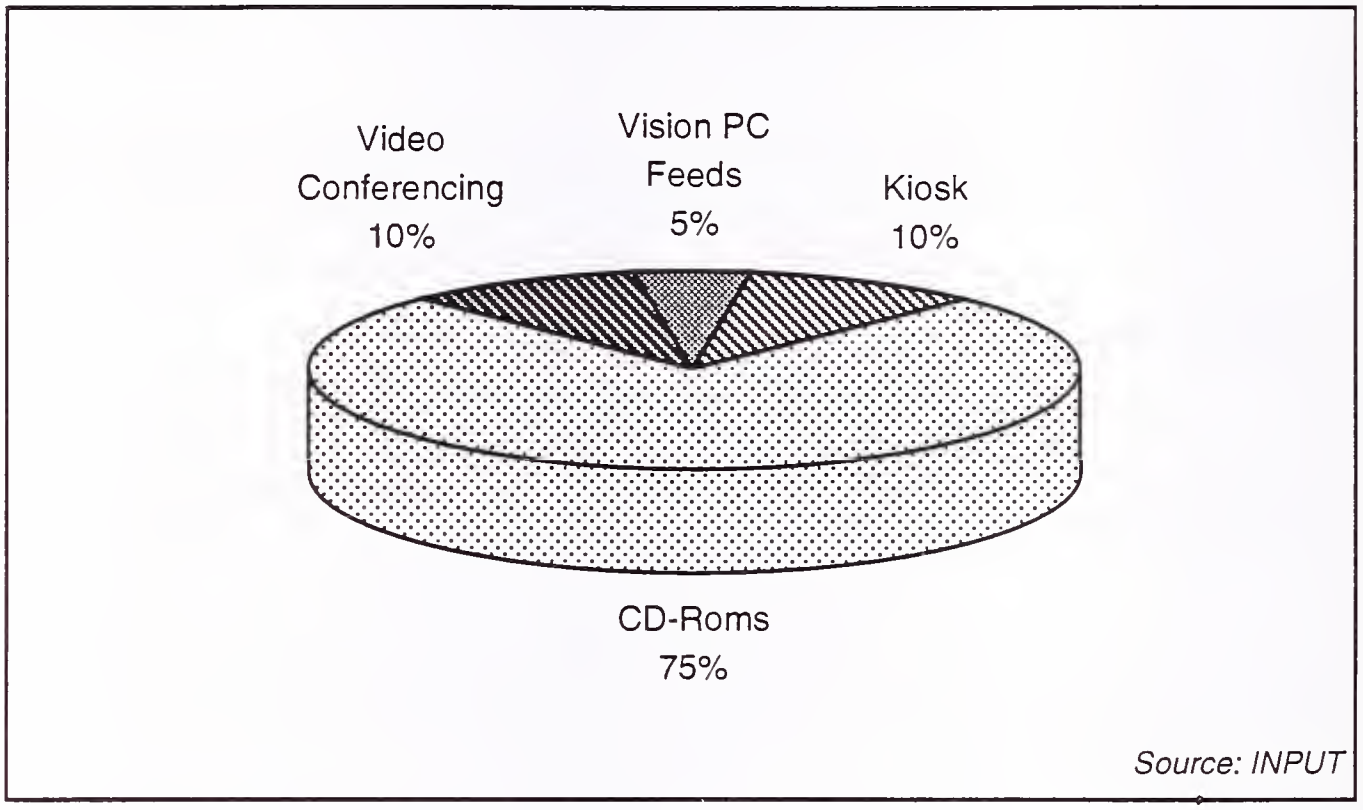
Faced with this hard sell, users aware of the learning curve ahead of them and intimidated by the uncertainty of its height and length are keen to demonstrate that they understand the issues and what is at stake. This is done through the use and repetition of language being used on the supply side of the marketplace.

However, as demonstrated in Exhibit IV-3, the overriding reality is that users' adoption of multimedia is still to all intents and purposes of a localised, stand alone, non-interactive software tool. When asked what multimedia technologies were being used in their organisations 75% of respondents mentioned CD-ROMs. Other technologies being used were video-conferencing, kiosks and moving image feeds on to PC platforms. These three examples were however, heavily outweighed by CD-ROMs.

Exhibit IV-4 summarises the qualities of multimedia predominately used at the moment, in essence via CD-ROMs, and the qualities of multimedia referred to by users in their definitions of multimedia. These definitions refer to the potential of multimedia.

Exhibit IV-3

Multimedia Technologies Being Used



Source: INPUT

Exhibit IV-4

Multimedia Qualities

Today	Tomorrow
Localised	On-Line
Read only	Interactive
Stand alone	Returned Integrated
Two media	Two (or more) Media
Text some graphics	(Text, graphics + one other)

Source: INPUT

Exhibit IV-5 summarises users' reasons for the non-implementation of available multimedia technologies beyond CD-ROMs.

Exhibit IV-5

Reasons for Non-implementation

- Cost
- Unquantifiable benefits
- Technology not yet proven
- Standards not yet stable

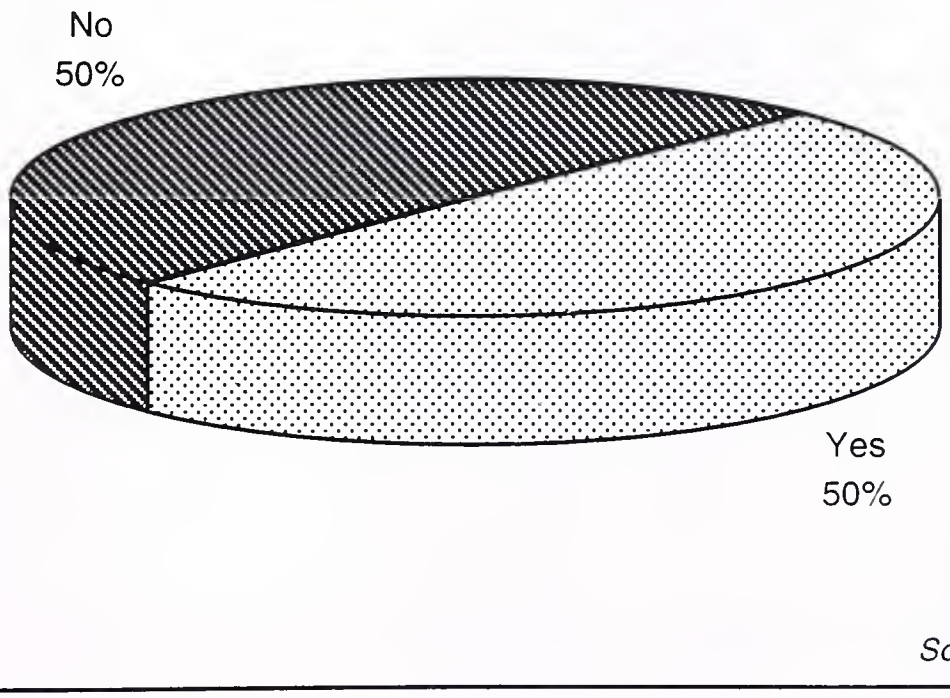
Source: INPUT

B
Multimedia Implemented by Half of Respondents

Exhibit IV-6 shows that 50% of respondents at the overall pan-European level have implemented some form of multimedia technology over the last year. It should be noted that the overall response rate to the questionnaire was of the order 1 in 6 which would depress this figure and suggests that a truer representation of adoption rates would be 8%.

Exhibit IV-6

Implementation of Multimedia in Last Year



Source: INPUT

CD-ROMs have been available in the business marketplace since 1990-91 and are becoming commonplace in many large and mid-sized organisations.

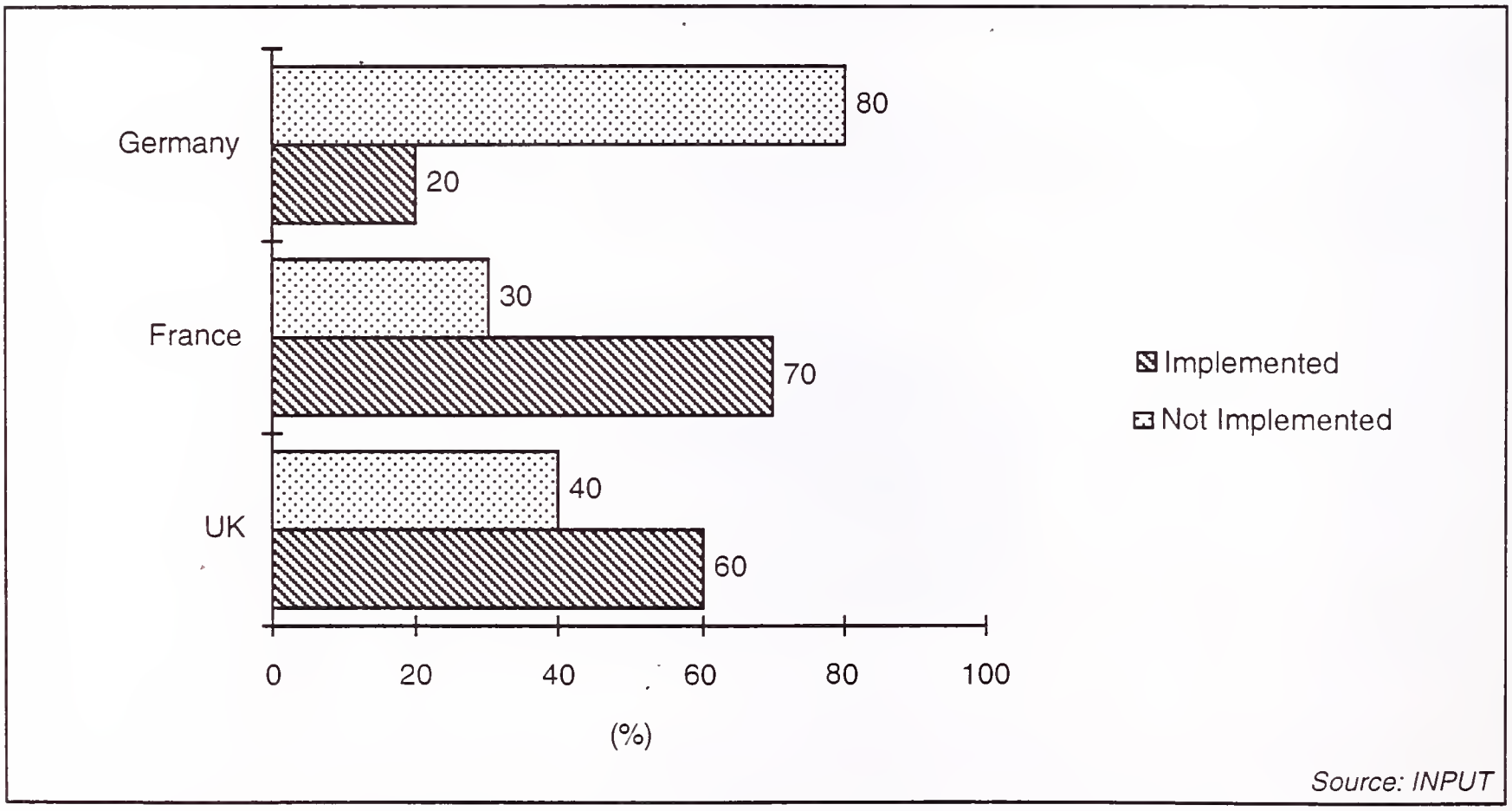
Increasingly, personal computers are being manufactured with a built-in CD ROM player, and are reaching the "magic price" of £1,000. Although as a proportion of overall PC shipments these are still a small part of the market, currently estimated at around 20%, this figure is expected to grow rapidly over the next two years.

This rapid growth in the uptake of CD-ROM preconfigured PCs is being mirrored by the rapid fall in prices of CD-ROMs disks. INPUT estimated that prices of CD-ROM titles will slide by 60% over the next five years (average price per title).

Exhibit IV-7 shows the broad differences in adoption of multimedia across the major country markets of France, Germany and the United Kingdom.

Exhibit IV-7

French, German and UK Implementation of Multimedia in Last Year



Source: INPUT

France is presently the leading country in adopting multimedia technologies. Over 70% of respondents implemented some form of multimedia in the last year.

France is closely followed by the UK market where 60% of respondents are utilising multimedia.

The chart clearly demonstrates that Germany is lagging the other two major country markets. The German market is traditionally a less innovative, creative, and risk-taking one than either the UK or France, let alone in comparison with the US market.

Not only is multimedia being accepted less readily than in the UK and France, but there is a lesser degree of development activity taking place. Germany's tax system and accounting rules favour large firms with strong and plentiful fixed assets and acts as a disincentive to small entrepreneurial start-up companies which in other countries are responsible for much of the development of software and content.

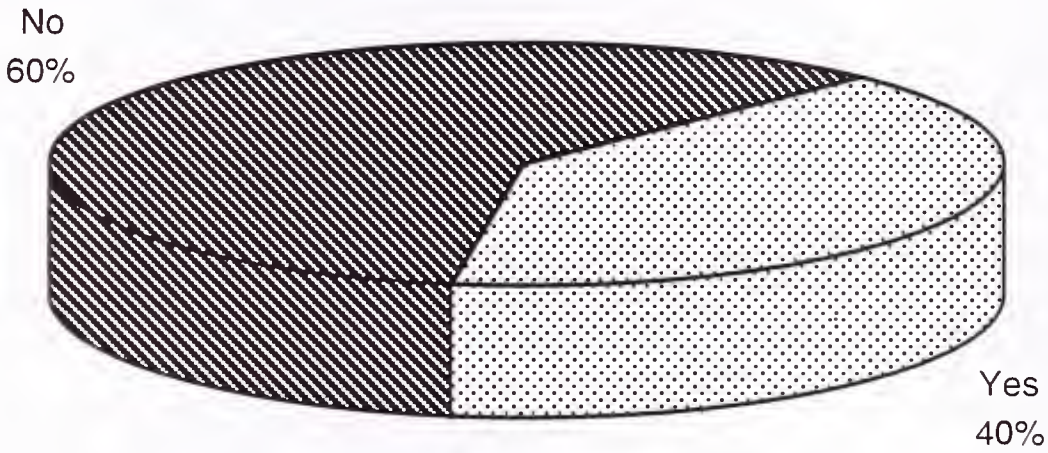
Although non-German developed software has historically travelled well into Germany the adoption rate has often been slower than in the UK and France.

C
"Followers" Remain to be Convinced

Exhibit IV-8 shows the intentions of respondents when asked if they had plans to implement multimedia technologies over the next two years.

Exhibit IV-8

Intention to Implement Multimedia over the Next Two Years



Sample of 30 respondents in France, Germany and UK. *Source: INPUT*

Forty per cent of those who have not yet implemented any form of multimedia plan to do so in this period.

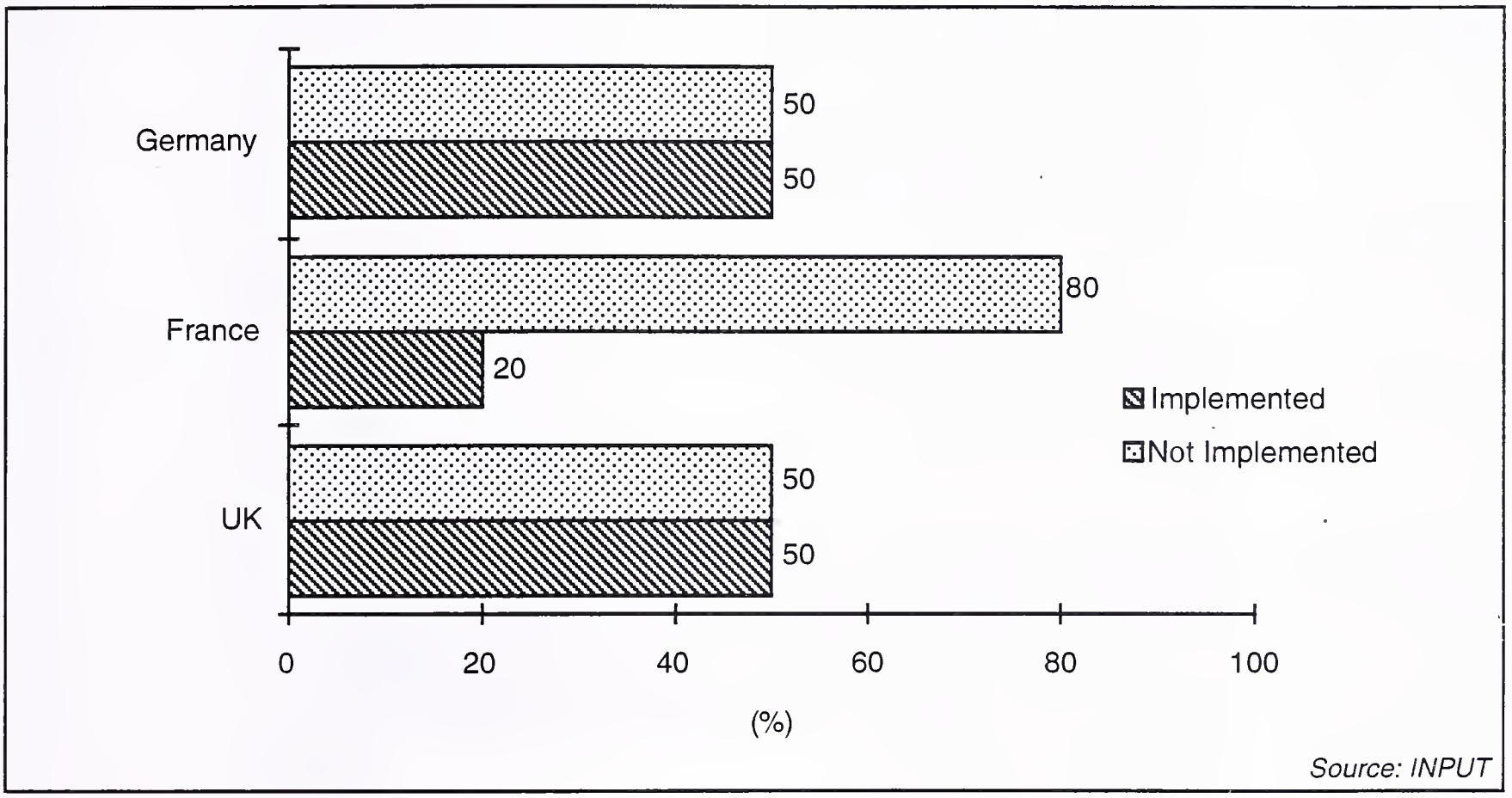
Rapid growth in PCs equipped with CD-ROM players, the fall in prices of software and hardware and the explosion of titles, both business and consumer-focused, will drive this growth.

There is however, a significant proportion of users who remain to be convinced of the need to acquire multimedia technologies, even at the low-cost CD-ROM level, in the foreseeable future.

Exhibit IV-9 shows the differences in response to the question of buying intention by major country market.

Exhibit IV-9

French, German and UK Multimedia Implementation Intentions over the Next Two Years



Source: INPUT

Perhaps the greatest surprise in these findings is that French respondents come out significantly ahead of Germany and the UK in responding negatively to this question.

A number of interpretations can be placed on this statistic:

- There is a greater gap between French early adopters and followers
- Negative views on multimedia from early adopters are influencing followers
- French followers are more sceptical of the potential benefits of multimedia than followers in the UK and France.

German and UK markets show very similar characteristics in response to the issue of multimedia implementation over the next two years.

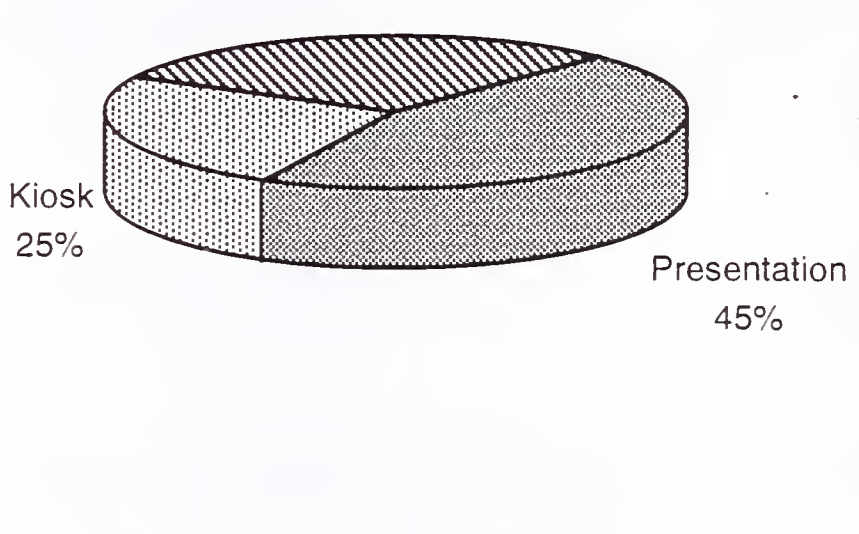
In the German marketplace where there has so far been the lowest adoption rate of multimedia technologies, there is clearly a strong awareness of the potential of multimedia. There is also an accompanying awareness that companies in other country markets are ahead of German companies on this adoption and learning curve.

D
Multimedia Predominately Used in Presentation-based Applications

Exhibit IV-10 shows the range of user applications that are currently available in multimedia technologies.

Exhibit IV-10

Implemented Applications of Multimedia



Source: INPUT

Multimedia offers the potential of greatly enhancing the ability to convey information. Through the judicious use of mixed media, multimedia is raising the standards of information presentation and making traditional approaches appear antiquated and second-class.

The ability to support an argument, clarify an issue, or produce a testimonial through the use of full-motion video, backed up with improved graphics and overall television-quality style, is offering companies increased leverage in many different business propositions.

These qualities are clearly applicable to the other two major applications which, according to users, are also benefiting from multimedia.

Computer Based Training (CBT) has been a steadily growing part of the overall training market for some time. INPUT believe that not only will multimedia become a much more significant part of training in general but that multimedia will become a major factor in driving growth in the overall training market.

Training budgets, which have been so radically pruned in the recessionary period of the last three years, have witnessed a healthy resurgence in the last six months. This trend will strengthen as users continue reskilling their IT and user-based departments in the wake of the growth of distributed client/server-based enterprise-wide architectures.

The third application to which users are bringing multimedia is kiosks. These are being used by retailers such as Thomas Cook and W.H. Smith, utilities such as British Gas and local government bodies such as Leicestershire County Council.

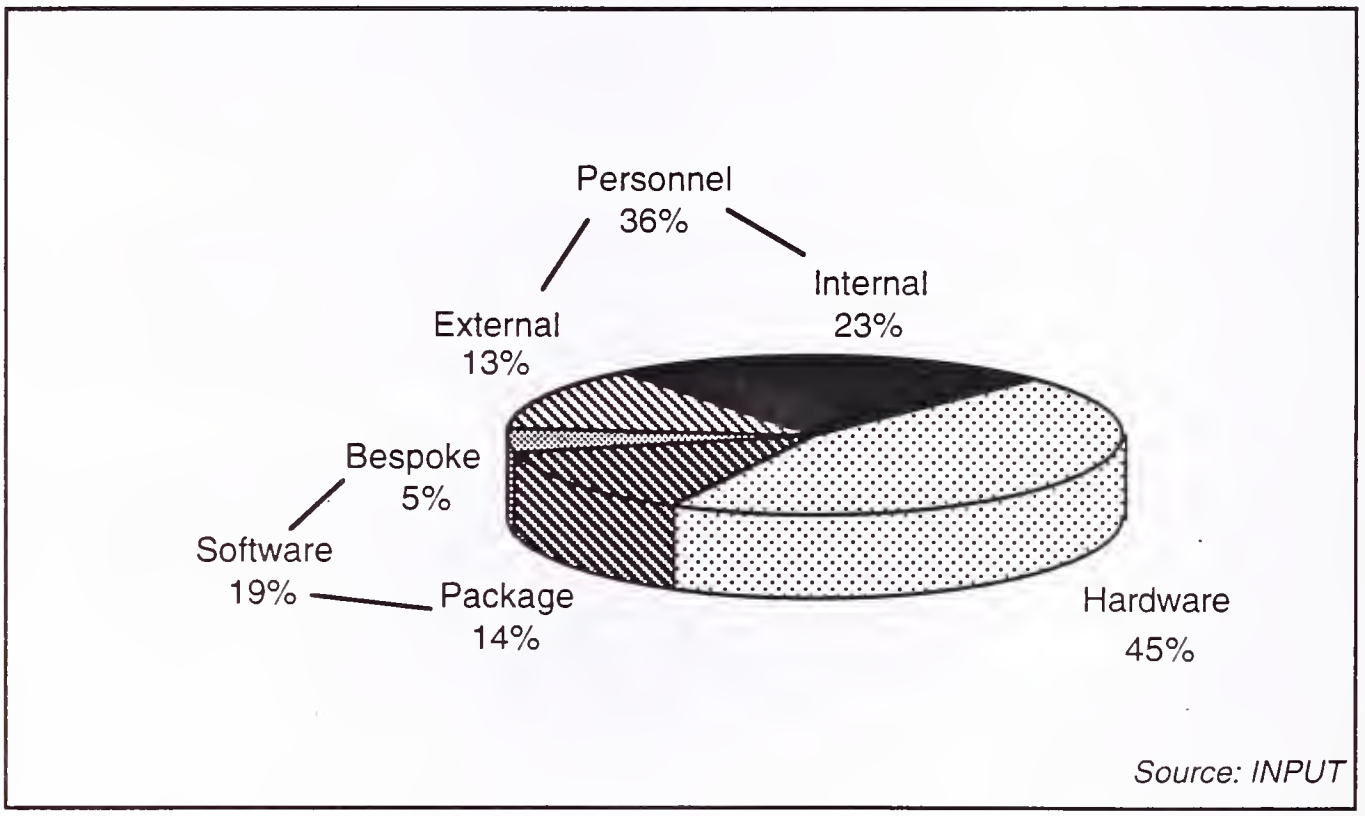
Kiosks are a combination of point-of-sale and information access points. At present the emphasis is on the latter. Both of these applications can expect to see strong growth over the medium term.

E
Users are Using External Companies to Develop Multimedia Systems

Exhibit IV-11 provides a cost analysis of multimedia development and implementation by hardware, software and personnel costs.

Exhibit IV-11

Cost Analysis of Multimedia Development and Implementation



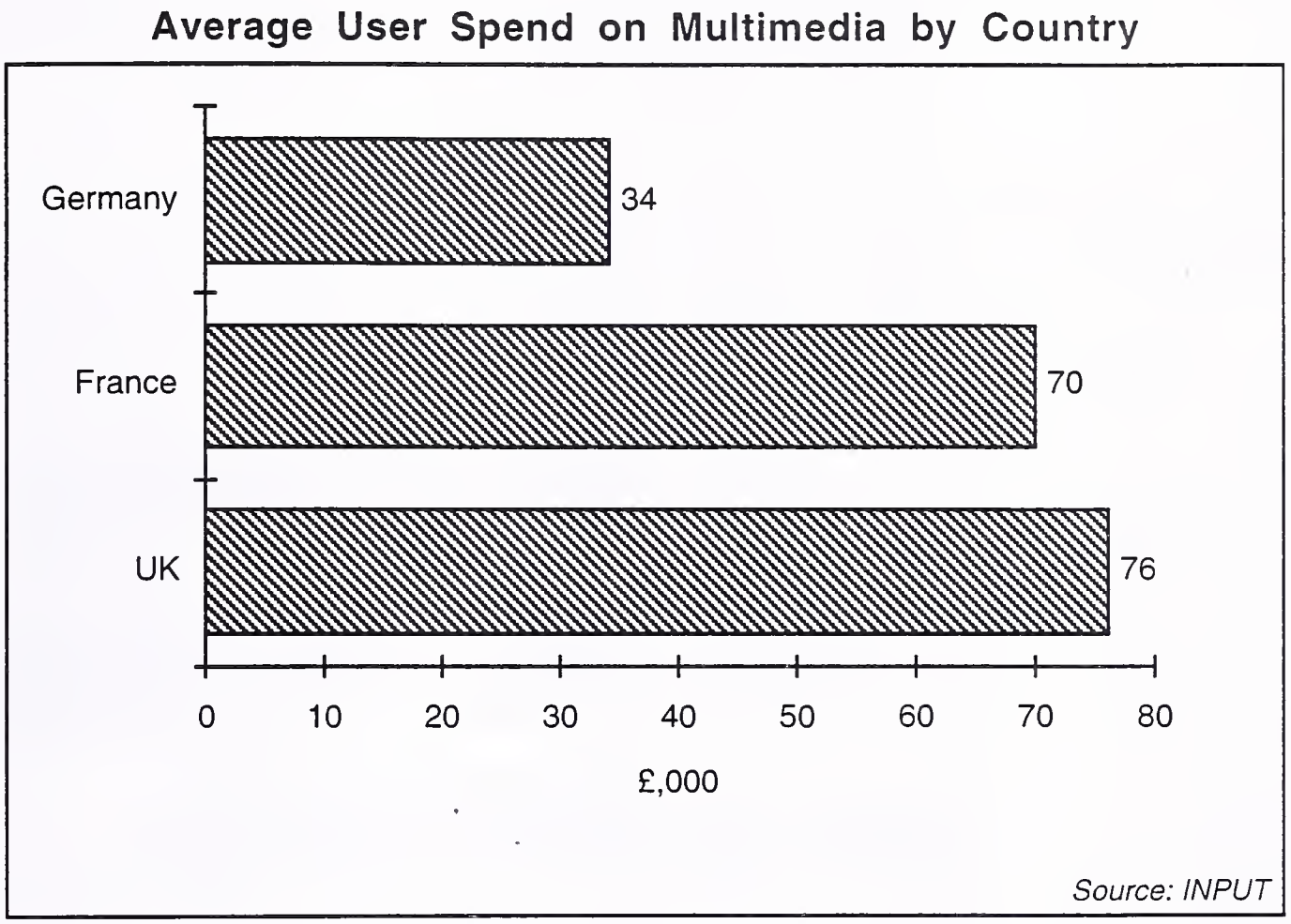
Source: INPUT

Although the majority of personnel spend is being directed internally (64%) there is a significant amount of spend going to external vendors (36%).

73% of multimedia software is being purchased off-the-shelf from the huge range of CD-ROM titles now available. Hardware represents 45% of multimedia spend.

The vast majority of companies surveyed in this report were unable or unwilling to detail their levels of spend on multimedia. From those who did INPUT have produced an analysis of average spend by country market as shown in Exhibit IV-12.

Exhibit IV-12



These numbers should be treated cautiously however due to the small sampling numbers involved.

They are provided to illustrate INPUT's assessment that levels of spend on multimedia are still extremely small.

Even with high growth forecasts the multimedia market, as represented predominately by CD-ROMs, will remain extremely small in the medium term.

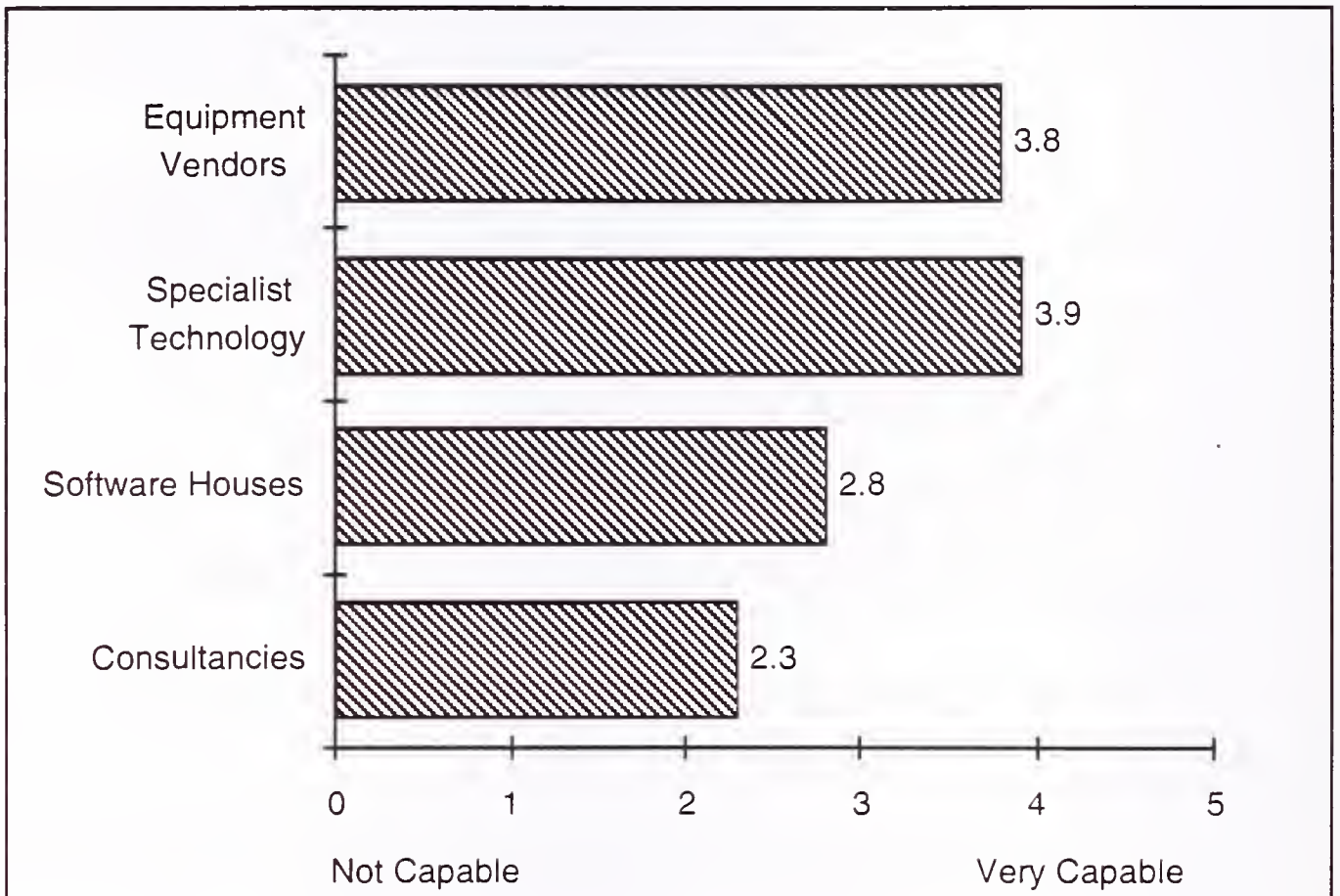
F

"Evolving" Equipment Manufacturers are well Placed to implement Multimedia

Exhibit IV-13 shows users' views at a European level of who will be best placed to implement significant multimedia projects.

Exhibit IV-13

User Views of Vendors' Capability to Implement Significant Multimedia Projects — Europe



Sample of 60 respondents *Source: INPUT*

There is a clear difference in users' perception between equipment manufacturers and specialist technology providers on the one hand and software houses and consultancies on the other.

Not surprisingly, specialist technology providers are perceived as being the vendors most capable of delivering and implementing multimedia technology. However, and more surprisingly, equipment vendors are perceived as being almost as capable as the specialist technology providers in this process.

There are two main reasons for this finding. Firstly it is a reflection of the enormous differentials in marketing spend that these two types of player can presently call upon. Much of the hype surrounding multimedia, referred to earlier in this chapter, is being generated by large multinational equipment-based manufacturers.

With the resources of professional marketing and PR techniques, these vendors are able to present their multimedia related messages to individual consumers and business consumers in a way that small specialist technology companies are unable to match. Secondly, users recognise that in tomorrow's multimedia market, players will require huge R&D budgets and a strong commitment to develop and market these technologies.

Exhibit IV-15, 15, and 16 show the country market differences from these overall European findings for France, Germany, and the UK respectively.

Exhibit IV-14

User Views of Vendors' Capability to Implement Multimedia — France

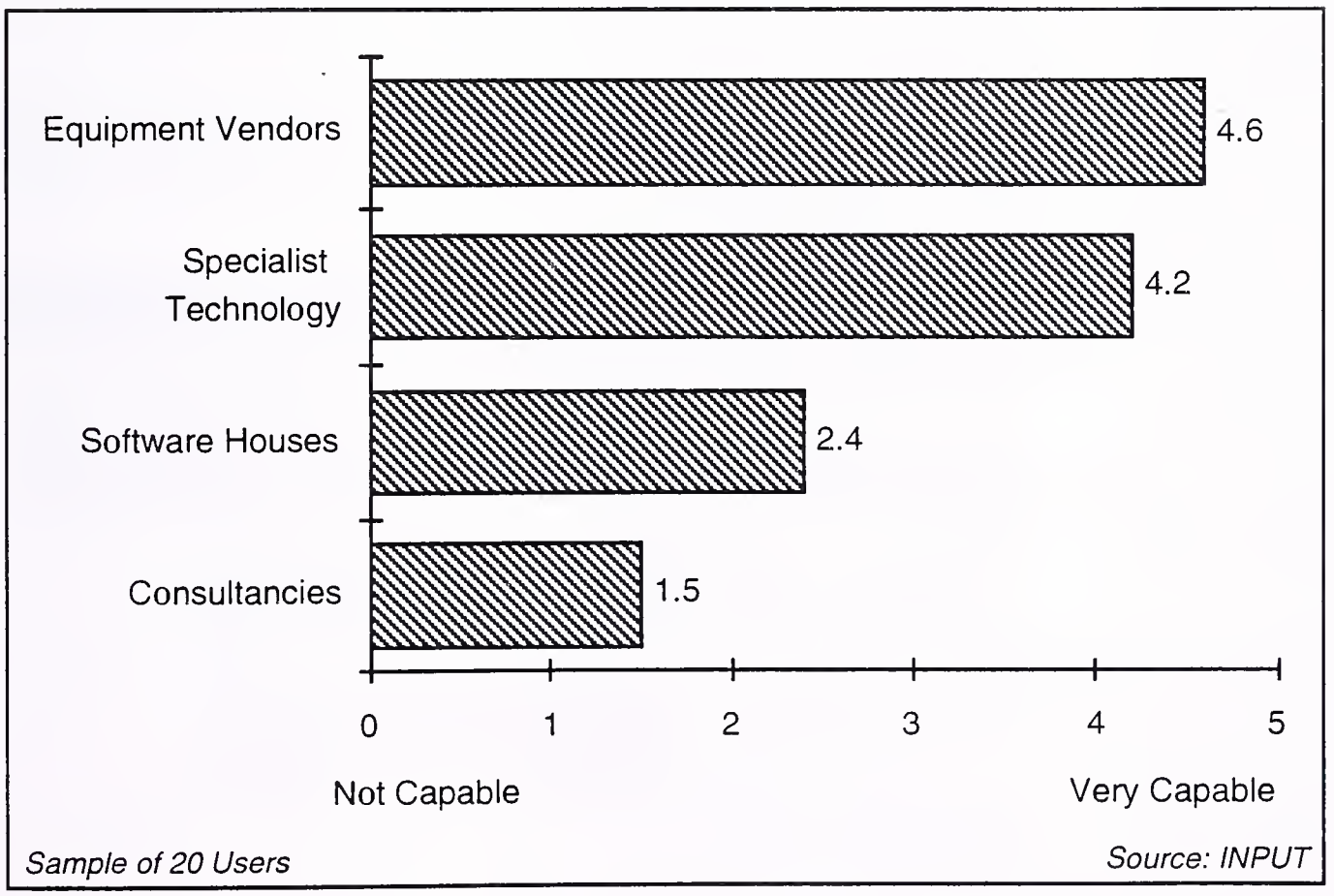
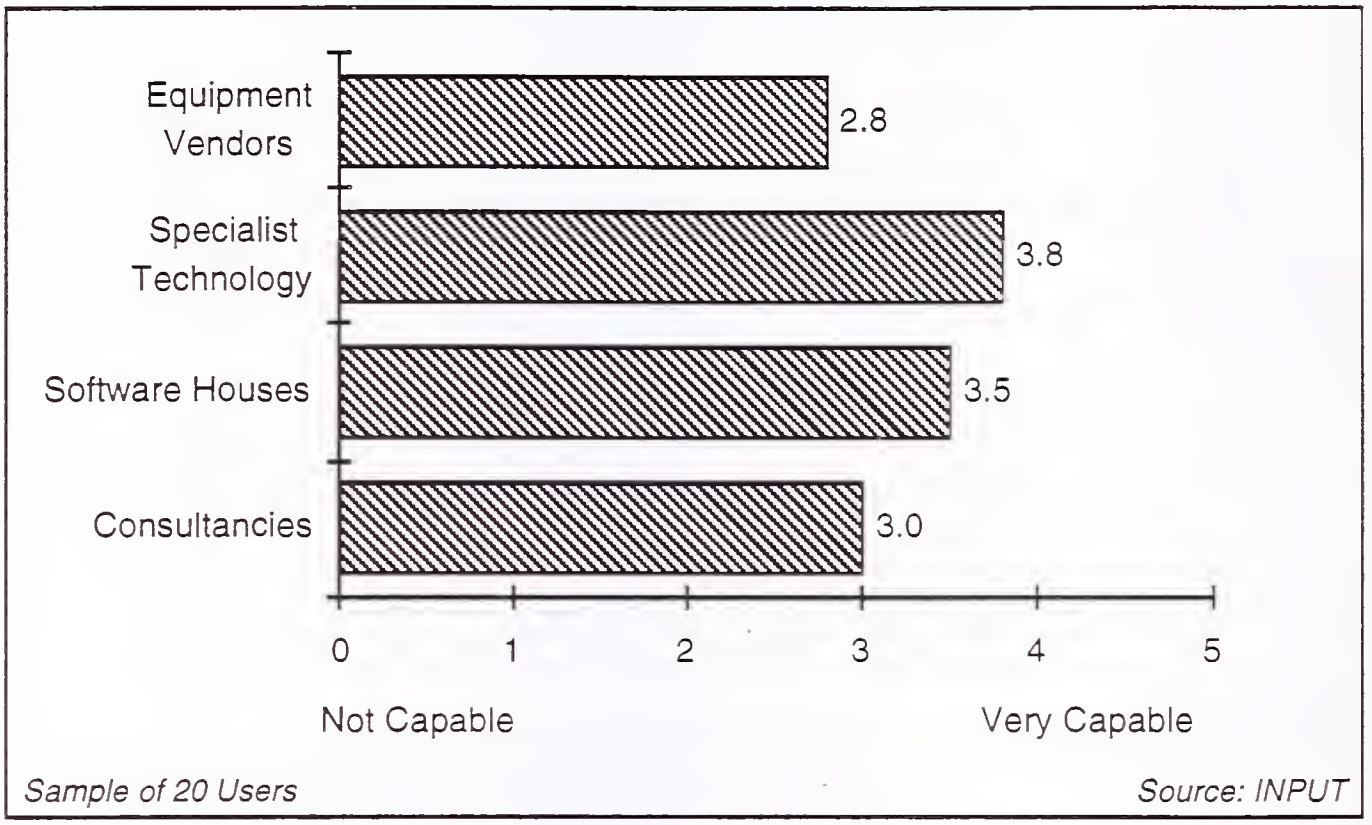


Exhibit IV-15

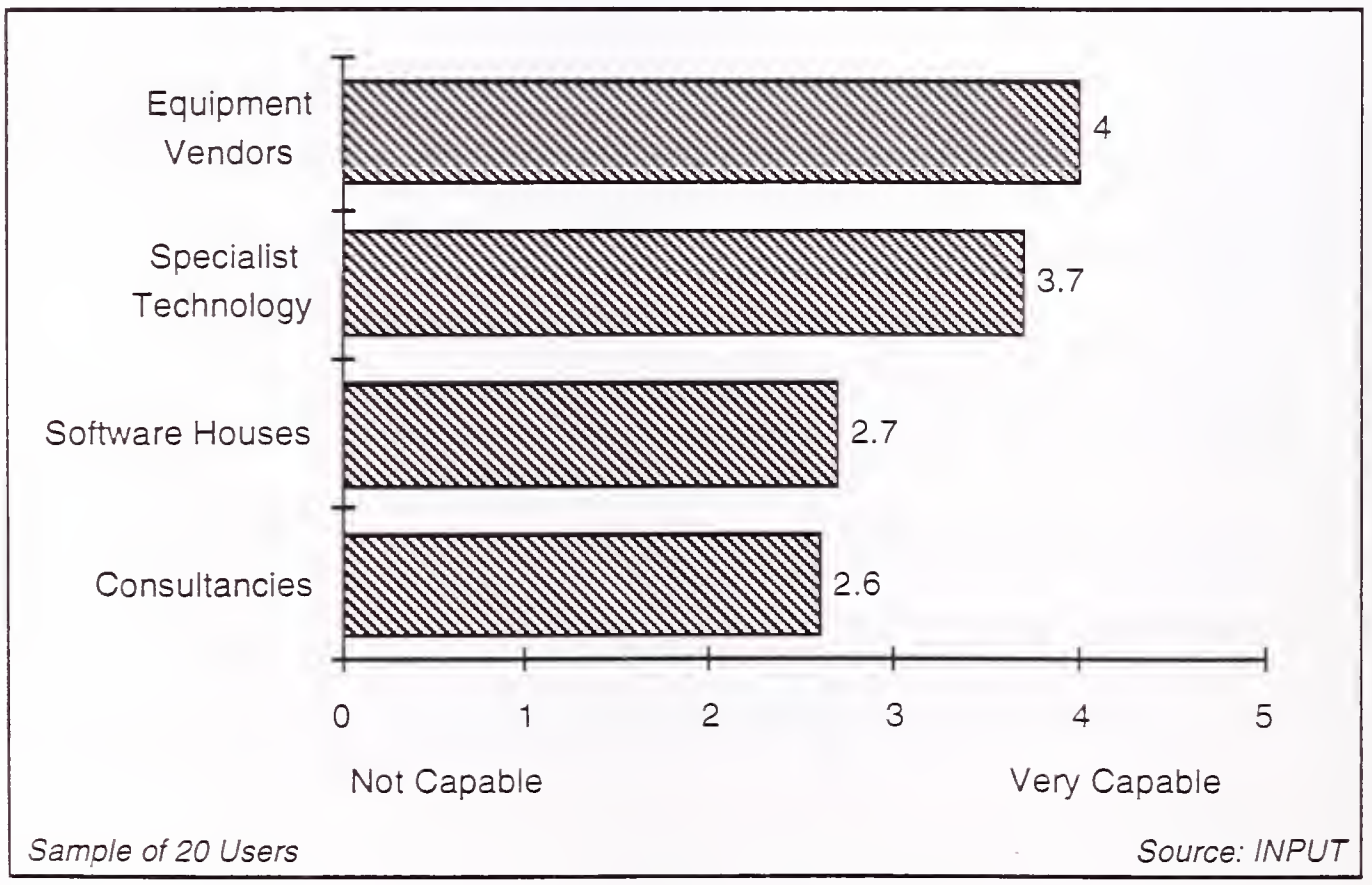
User Views of Vendors' Capability to Implement Significant Multimedia Projects — Germany



Sample of 20 Users *Source: INPUT*

Exhibit IV-16

Users View of Vendors' Capability to Implement Significant Multimedia Projects — United Kingdom



Sample of 20 Users *Source: INPUT*

V

Vendor Views

This chapter provides analysis of responses from 15 vendors of business integration (BI) services to the questionnaire which is attached in Appendix B.

These responses were supplemented by face-to-face interviews with five vendors to discuss and clarify specific issues, gain both a high level and detailed view of vendors' initiatives and understand BI vendors strategic plans for alliances, joint ventures and partnership-based multimedia-related operations.

A

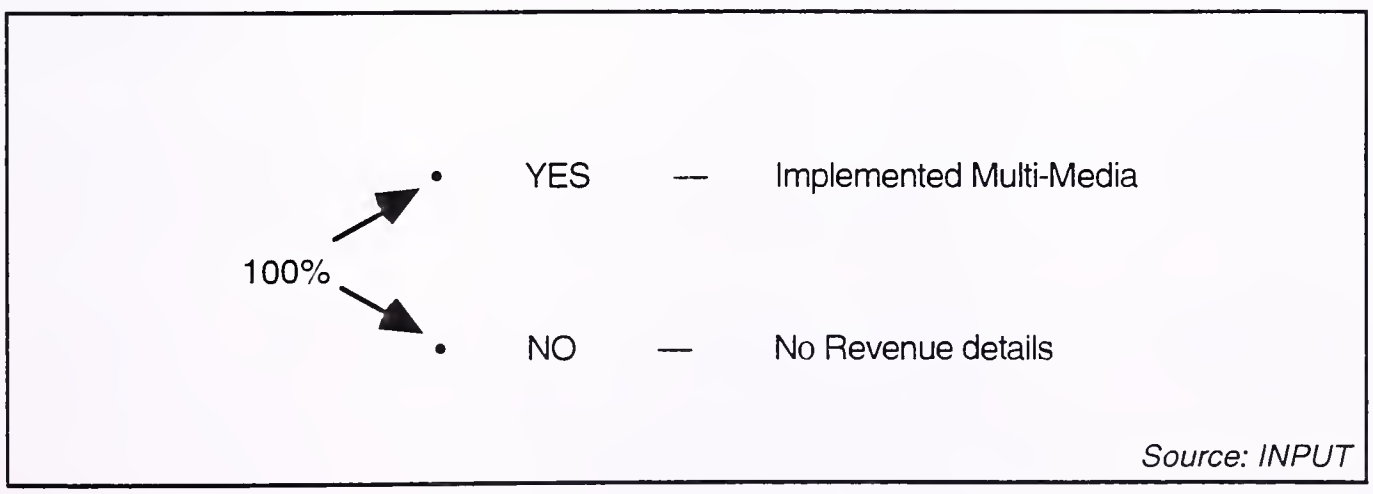
Vendors View Multimedia as a Long Term Opportunity

All of the vendors surveyed in this report state that they have implemented some form of multimedia technology, both internally and within client organisations.

However, as shown in Exhibit V-1, none of these vendors felt able or were able to produce any details regarding revenues or potential revenues being generated by these or future implementations.

Exhibit V-1

Multimedia Implementation and Revenues



Vendors are able, anecdotally, to supply outlines of investment budgets and predicted research and development spend but not actual revenues.

Some vendors such as Microsoft Corporation are already on record as stating that revenue returns must be seen in the context of the long term, i.e. over 10 years. Microsoft have over the last three years already spent $250m on Information Superhighway-related research and plan to continue spending $120m per annum until 2004.

Vendors claim that currently they are:

- Unable to delineate the multimedia component within systems integration (SI) projects
- Unconcerned with tracking multimedia-related spend
- Committed to long-term development and deployment of multimedia.

It is clear that multimedia is a "must play" and "me too" environment. All vendors claim that multimedia will be an important area of opportunity which they will pursue vigorously.

INPUT's research however suggests that for computer services vendors with an equipment background it will be the medium term (i.e. three to five years) before their BI operations begin to become involved with tendering for SI type contracts dependent on a significant multimedia component or delivery capability. INPUT's definition of SI contracts is those over $2m.

B
Supply-side Push Currently Defines the Marketplace

Exhibit V-2 presents a summary of the most commonly expressed definitions of multimedia by vendors.

Exhibit V-2

Vendor Definitions of Multimedia

- Convergence
- Video on the desktop
- Interactive Digital Information
- *Not* CD-ROM

Source: INPUT

It is clear that vendors of BI services are aggressively subscribing to, and subsequently marketing to their clients, the high-level view of the potential of multimedia.

BI vendors state that multimedia means convergence of telecommunications, entertainment, and computing, video-on-demand, video-on-the-desktop and fully interactive digital information.

Vendors of BI services expressly state that multimedia is not purely CD-ROMs.

Multimedia technologies are impacting at both the infrastructure and process level. The nature and timescales of impact and subsequent nature of project opportunities for vendors, however, will vary significantly.

At the infrastructure level, network systems integration has increasingly been a major source of project opportunities for business integrators. Vendors clearly believe that this is *true* multimedia.

Projects carried out under the broad title of convergence are seeing large network carriers such as AT&T, and the Baby Bells, and vendors such as IBM, focusing on placing video servers in existing voice-and-data networks and providing fully-integrated transport of voice, picture; full motion video and text.

Networked multimedia technology is the key to related applications becoming embedded in business processes.

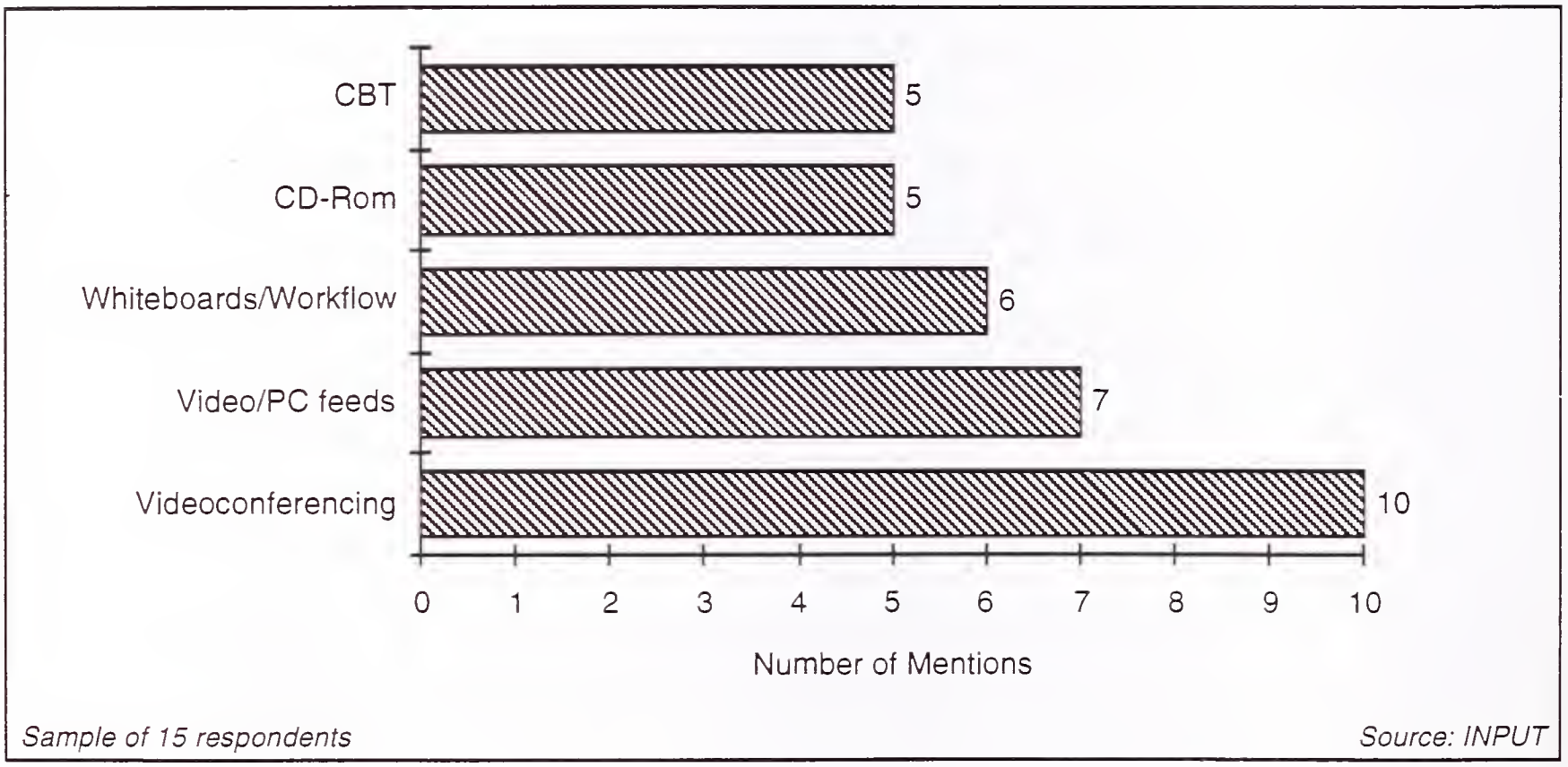
However, this is currently having only a small impact on actual business processes and currently offers a limited market opportunity to BI vendors.

C
Video-conferencing is Regarded as a Key Technology

Exhibit V-3 shows vendors' responses when queried about which technologies they were implementing in client organisations.

Exhibit V-3

Multimedia Technologies Used



Sample of 15 respondents *Source: INPUT*

Although vendors are explicitly aware that stand alone CD-ROMs do not present mainstream business integration opportunities many vendors subsequently mention CD-ROMs when queried about these implementations.

The most significant amount of development work being carried out in this arena is the conversion by the Rover Group, British Gas and British Airways, amongst others, of paper-based engineering manuals into CD-ROMs, able to store greater amounts of relevant information in more depth and in a more user-friendly way than traditional methods.

Rover Group has installed CD-ROMs in the majority of their manufacturing plants in the UK. BMW, which has recently purchased equity in Rover, is expected to introduce this technology into their German operations in 1995.

Computer-based training (CBT) is another area in which vendors are using multimedia technologies. CBT is an established tool; the utilisation of video presentations and detailed demonstrations will significantly enhance its effectiveness.

The integration of whiteboard technologies is a further area in which vendors report interest from users. The ability to share data across networked PC's or workstations, adding a whiteboard or shared notepad facility, will become a key technology. Whiteboards offer groups of workers the ability to share ideas and information in real time; similarly to how it is done in informal face-to-face meetings.

The research clearly shows, that the integration of full motion video is regarded as the primary technology of the multimedia age. The integration of video onto the desktop, via a Windows-type graphical user interface (GUI) on the PC or workstations is established as the most frequently mentioned technology in terms of implementation.

This technology encompasses one-to-one, one-to-many, and many-to-many video-conferencing, but also the extension of television on to a single desktop PC.

Television feeds are already widely available within the financial services sector, as seen on dealing room floors. These are currently primarily provided through dedicated stand-alone terminals. Although networked systems integration is a major market which vendors of BI services already serve, fully compliant PC/TV integration is still at an early stage of development and currently has a low installed base.

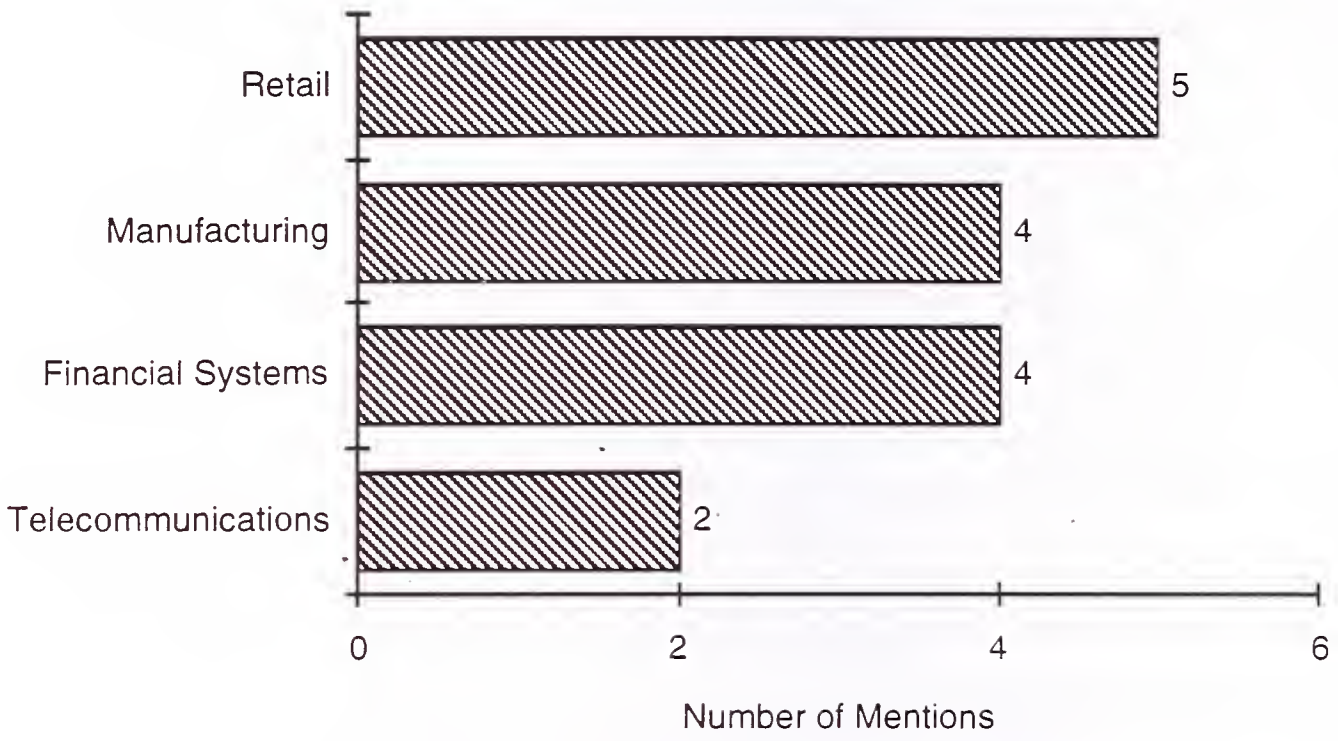
Full-scale video conferencing is still prohibitively expensive, technologically extremely complex, and from the vast majority of potential users, of unproven business benefit.

D
Retailers Drive Early Adoption of Multimedia

Exhibit V-4 shows the industry sectors and Exhibit V-5 the business processes which are currently employing multimedia technologies.

Exhibit V-4

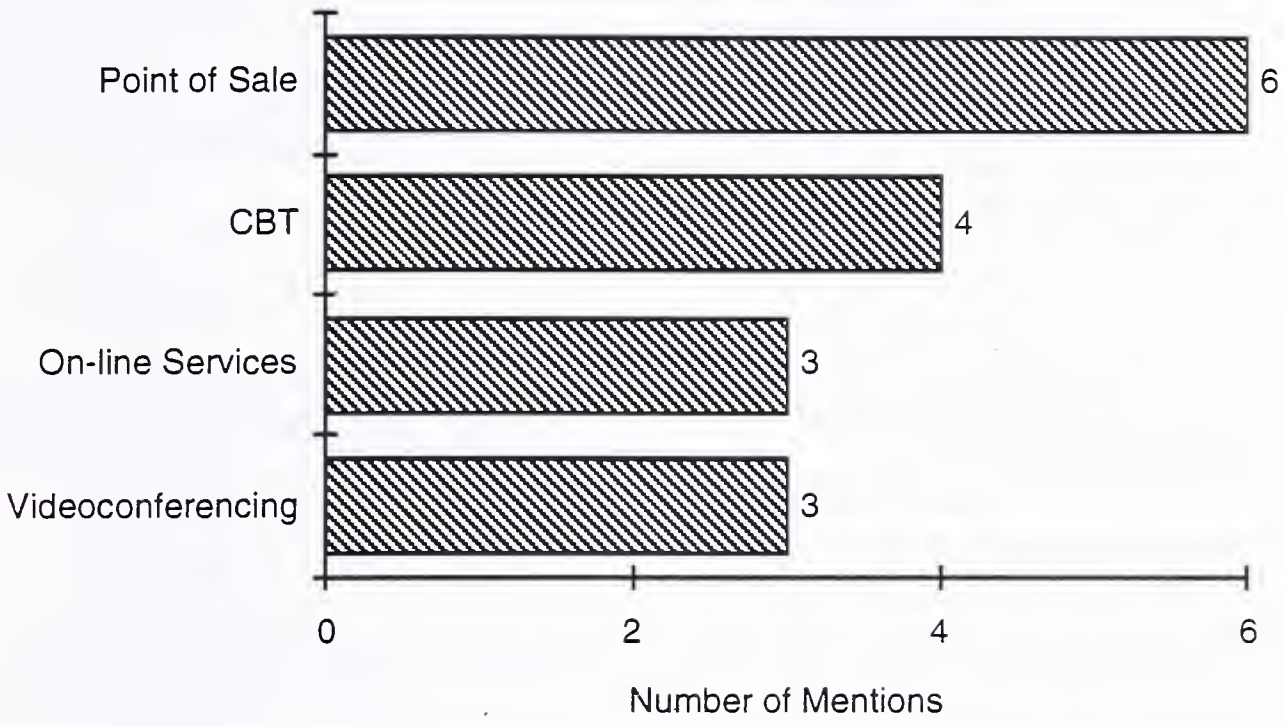
Industry Sectors Using Multimedia Technologies



Sample of 15 respondents *Source: INPUT*

Exhibit V-5

Business Processes Using Multimedia Technologies



Sample of 15 respondents *Source:INPUT*

A number of leading UK retailers such as Safeway, Thomas Cook, and Boots, are putting in place multimedia access for in-store use as well as opening home-shopping TV channels. Multimedia booths will allow customers to see videos of fashion shows, order clothes, discuss in real-time tailoring alterations and pay through a credit card transaction.

Vendors, including British Telecom and Oracle, are working with a consortium of UK and overseas banks to develop "banking booths".

E
Traditional Systems Integration Skills will Remain Important

Vendors clearly believe that they have a significant role to play in the implementation of multimedia.

Exhibit V-6 lists the most relevant qualities vendors believe they will bring to the new age of multimedia. These qualities reflect the traditional strengths of the large BI vendor community.

Exhibit V-6

Systems Integration Qualities Relevant to Multimedia Implementation

- Independence
- Project Management
- Implementation Skills
- Consultancy
- Partnership Management

Source: INPUT

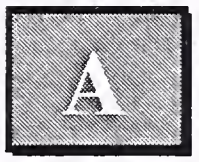
Vendors increasingly recognise that in major technological implementation no one vendor has the total solution. This will undoubtedly be the case in multimedia implementation where BI vendors will be presented with best-of-breed tools and solutions from a wide variety of organisations both large and small.

The ability to utilise these products and approaches in already open, increasingly distributed, architectures will be crucial.

Business integrators are well placed, due to their prime contractor experience and project management skills, to gain an important share of a more developed multimedia implementation market.

However, integrators will only be able to leverage their traditional skill sets if these are allied to expertise and experience of the emerging technologies.

Vendors are already comfortable with the need to use external companies to develop both hardware and software and suggest that as much as 35% of development work is currently being performed by contractor companies.



User Questionnaire

1. Has your organisation implemented any multimedia technologies over the last year?

   Yes

   No

   If yes to Q1 please go to question 2. If no to Q1 please go to Q15.

2. What business processes were these implementations associated with?

3. What applications were produced/implemented?

4. What multimedia technologies were used?

5. What platforms were used to support these applications?

6. What was the cost of this work?

	Cost*
Software Total	
% Package	
% Bespoke	
Hardware	
Personnel Total	
% In-house	
% Contractor	
Total	

* please state currency

7. Can you name the sub-contractor(s)?

8. Can you describe the level and nature of their involvement?

9. What do you believe is/are the main role(s) an external prime contractor should play in this type of project?

10. How are you sourcing multimedia skills?

11. Do you have any joint ventures, alliances or partnerships with other multimedia players?

    Yes

    No

    If yes, please describe then go to Q13. If no please go to Q12

12. Are you planning joint ventures, alliances, partnerships with other multimedia players?

    Yes

    No

    If yes, please describe. If no, please go to Q13

13. Do you have plans for further multimedia implementations over the next two years? If so, please can you describe these.

14. Have you rejected vendor recommendations to utilise multimedia technologies over the last two years?

    Yes

    No

    If yes, please describe why.

    If you replied "yes" to Q1 please stop here.

15. Does you organisation have plans to implement multimedia over the next year?

    Yes

    No

    If yes, please describe. If no, please stop here.

16. What business processes will these implementations be associated with?

17. What applications will be produced/implemented?

18. What multimedia technologies will be used?

19. What platforms will be used to support these applications?

20. What will be the cost of this work?

	Cost*
Software Total	
% Package	
% Bespoke	
Hardware	
Personnel/ Total	
% In-house	
% Contractor	
Total	

* please state currency

21. Can you name the subcontractor(s) you are planning to use if any?

22. Can you describe the level and nature of their involvement?

23. What do you believe is/are the main role(s) an external prime contractor should play in this type of project?

24. How are you sourcing multimedia skills?

19. What platforms will be used to support these applications?

20. What will be the cost of this work?

	Cost*
Software Total	
% Package	
% Bespoke	
Hardware	
Personnel/ Total	
% In-house	
% Contractor	
Total	

* please state currency

21. Can you name the subcontractor(s) you are planning to use if any?

22. Can you describe the level and nature of their involvement?

23. What do you believe is/are the main role(s) an external prime contractor should play in this type of project?

24. How are you sourcing multimedia skills?

Blank

B

Vendor Questionnaire

1. Multimedia currently means different things to different people. How does your organisation define multimedia?

2. Has your organisation implemented any multimedia technologies over the last year?

   (a) Internally Yes No

   (b) In a client organisation Yes No

   If yes to question 2(a), please go to question 20. If yes to question 2(b), please go to question 3. If yes to both, go to question 3.

3. What industry sectors were these implementations associated with?

4. What business processes were these implementations associated with?

5. What applications were produced/implemented?

6. What multimedia technologies were used?

7. What platforms were used to support these applications?

8. Can you provide details of revenues from multimedia implementation over the last year?

9. Can you provide details of revenues from multimedia implementation over the last year by:

	Description	Revenue *
Technology		
Process/Application		
Country		
Vertical		

* please state currency

10. Was any part of the project(s) subcontracted?

    Yes

    No

11. If yes to question 10, please describe which elements. If no to question 10, please go to question 14.

12. Can you name the subcontractor(s)?

13. Can you describe the level and nature of their involvement?

14. What do you believe is/are the main role(s) an external prime contractor should play in this type of project?

15. Can you describe how you are marketing your multimedia capabilities?

16. How are you sourcing multimedia skills?

17. Do you have any joint ventures, alliances or partnerships with other multimedia players?

    Yes

    No

    If yes, please describe then go to question 19. If no, please go to question 18.

18. Are you planning joint ventures, alliances or partnerships with other multimedia players?

    Yes

    No

    If yes; please describe. If no, please go to question 19.

19. Have multimedia recommendations been rejected by a client over the last year? If so, please can you describe why?

    If you replied no to question 2(a) please stop here. If you replied yes to question 2(a) please continue to question 20.

20. In your internal implementation of multimedia technologies, what business processes were these associated with?

21. What applications were produced/implemented?

22. What was the cost of this work?

23. What platforms are used to support these applications?

24. Was an outside supplier used?

    Yes

    No

25. Can you name them?

26. Can you describe the level and nature of their involvement?

27. Do you have plans for further multimedia implementations over the next two years? If so, please can you describe these.

Thank you for your assistance

Blank