WESTERN EUROPEAN SYSTEMS INTEGRATION

USER ISSUES

1880

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WESTERN EUROPEAN SYSTEMS INTEGRATION USER ISSUES







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Abstract

This report evaluates the positioning of equipment vendors, professional services vendors, and management consultants within the Western European systems integration market. It also considers users' levels of satisfaction with systems integration projects and factors that determine the success or failure of individual projects.



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Table of Contents

Ι	Introduction	1
	A. Objectives	1
	B. Scope	1
	C. Methodology	2
	D. Report Structure	2
П	Executive Overview	5
	A. Client-Vendor Relationship—The Key to Successful	5
	Systems Integration	
	B. The Buying Process	6
	C. User Satisfaction	10
	D. Vendor Issues	12
III	User Perceptions	15
	A. Pressures for Adopting Systems Integration	15
	B. Role of External Vendors	17
	C. Vendor Strengths and Weaknesses	21
	1. Major Equipment Vendors	21
	2. Management Consultancies	23
	3. Professional Services Vendors	24
	4. Implications	26
	D. User Satisfaction	27
	E. Case Study—Systems Integration Project	31
	F. Pricing Issues	34
IV	Implications for Vendors	37

i

Table of Contents (Continued)

	11
Annen	DAY10
Thhere	IUIACS
1 I I	

Α.	Definition of Terms	39
B.	Related INPUT Reports	45
C .	Systems Integration Questionnaire	47
	User Issues	

Exhibits

-1	Western European Systems Integration—Vendor Selection	6
	Factors	
-2	Western European Systems Integration—Perceived	8
	Strengths and Weaknesses of Management Consultancies	
-3	Western European Systems Integration—Perceived	8
	Strengths and Weaknesses of Professional Services Vendor	S
-4	Western European Systems Integration—Perceived	9
	Strengths and Weaknesses of Major Equipment Vendors	
-5	Western European Systems Integration—User Satisfaction	10
•	Levels	
-6	Western European Systems Integration—Factors Leading	11
Ū	to Project Failure	
-7	Western European Systems Integration—Issues for	12
,	Vendors	1
-8	Western European Systems Integration—Fixed-Price	13
Ŭ	Contracts	10
		1 ~
-1	Western European Systems Integration—Driving Forces	15
-2	Western European Systems Integration—Reasons for Use	16
	of External Vendors	
-3	Role of External Vendors	17
-4	Changing Role of Information Systems Department	19
-5	Willingness of Information Systems Departments to Use	21
	Systems Integrators	
-6	Western European Systems Integration—User Attitudes to	21
	Use of Major Equipment Vendors	
-7	Western Furgean Systems Integration_Perceived	22

- •7 Western European Systems Integration—Perceived 22 Strengths and Weaknesses of Major Equipment Vendors
- -8 Western European Systems Integration—User Attitudes to 23 Use of Management Consultancies
- -9 Western European Systems Integration—Perceived 24 Strengths and Weaknesses of Management Consultancies
- -10 Western European Systems Integration—User Attitudes 25 to Use of Professional Services Vendors
- -11 Western European Systems Integration—Perceived 25 Strengths and Weaknesses of Professional Services Vendors
- -12 Western European Systems Integration—Factors in 27 Vendor Selection

iii

Π

III

Exhibits (Continued)

-13	Western European Systems Integration—User Satisfaction Levels	28
-14	Western European Systems Integration—Why Projects	28
-15	Western European Systems Integration—Why Projects Succeed: User Perceptions	29
-16	Western European Systems Integration—Inhibitors	30
-17	Case Study—Initiation of Project	32
-18	Case Study—Commencement of Project	32
-19	Case Study—The Issues	34
-20	Western European Systems Integration—Fixed-Price Contracts	35
-1	Western European Systems Integration—Factors Leading to Project Failure	38

-2 Western European Systems Integration—Issues for 38 Vendors

III

IV

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Introduction



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Objectives	This report examines systems integration from the user perspective. Its objectives are to identify:
	• The roles performed by software and services vendors in the systems integration market
	• The nature of the buying process, and the positioning of the various categories of software and services vendor
	• Users' level of satisfaction with systems integration projects
	 The principal factors that contribute to the success or failure of systems integration projects
В	
Scope	This report analyses the buying process and the reasons for success or failure of systems integration projects within Western Europe.
	Systems integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of informa- tion systems products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.
	To be included in the information services market, systems integration projects must involve some application processing component. In addi- tion, the majority of cost must be associated with information systems

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	The systems integrator will perform, or manage others who perform, most or all of the following functions:
	 Program management, including subcontractor management Needs analysis Specification development Conceptual and detailed systems design and architecture System component selection, modification, integration and customisation Custom software design and development Custom hardware design and development Systems implementation, including testing, conversion and postimplementation evaluation and tuning Life cycle support, including System documentation and user training Systems operations during development Systems maintenance Financing
С	
Methodology	The research that contributes to this study was derived from the follow- ing sources:
	• Eight in-depth interviews conducted either face-to-face or by telephone with leading users of systems operations within Western Europe.
	• The use of INPUT's library facilities, which include press releases, trade press, newspaper and magazine articles
	• INPUT's continuous annual analysis of the computer software and services market, which includes an extensive series of interviews with both vendors and users in Europe.
D	
Report Structure	Chapter I provides details of the objectives and scope of the research, together with the methodology used.
	Chapter II is the Executive Overview of the entire report. It summarises the principal findings of the research with an emphasis on vendor posi- tioning in the systems integration market and an evaluation of the factors which contribute to the success or failure of systems integration projects.

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Chapter III considers user perceptions in more detail. It starts with a discussion of the pressures that lead to the adoption of systems integration and the role played by software and services vendors. Vendor positioning within the systems integration market is then evaluated in depth. The analysis of the reasons for the success or failure of systems integration projects is illustrated by a case study of a project conducted by a major user in the service industry.

Chapter IV considers the implications of these findings for vendors in terms of market positioning and successful management of major projects.



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Executive Overview

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Executive Overview

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Client-Vendor Relationship—The Key to Successful Systems Integration

Systems integration projects are large and complex and so carry high levels of risk. While the vendor is the principal adviser to the client, the client must take overall responsibility for the project and become actively involved in its management. Some users experience difficulty in becoming sufficiently involved and taking appropriate levels of project management responsibility. The key to successful implementation is the sharing of project management responsibility between client and vendor.

Problems arise in building this relationship partly because vendor responsibility for project management frequently falls in the gap between top management and the in-house information systems department. Top management may be impressed by the systems integration vendor's ability to understand their business problems and suggest the development of appropriate information systems for the business. However, top management does not necessarily have the skills to evaluate the vendor's development capabilities or set up the infrastructure to manage the vendor effectively at a detailed level.

Conversely, the information systems personnel are likely to be experienced in evaluating and monitoring vendors at a detailed level, but may find that they are by-passed by the systems integration vendor who prefers to report directly to top management.

The key area which needs to be managed by the client is the initial system specification. As well as ensuring that it meets the client's business needs, it is vital that the client, rather than the vendor, decides on the trade-off between cost and functionality. The specification must be both detailed and realistic while avoiding over-elaboration. .

	Strong management by the user is also essential to ensure that:	
	 The client takes ownership of the system. The quality of the development is regularly reviewed. Cost and timescale milestones are established and closely monitored. Technology transfer takes place. 	
	Systems integration projects often arise out of a changing business focus or a recognition that existing information systems have not kept pace with the evolution of the business. Accordingly, they tend to be initiated by top management rather than information systems management.	
	This means that the management consultancies are well positioned to capture systems integration business, since they are perceived by top management to understand their business and the manner in which information systems can best be used to support overall business objec- tives.	
	The professional services vendors have good working relationships with information systems management, but this is unlikely to lead to wide- spread systems integration projects. Information systems departments prefer to manage large projects in-house, where possible.	
	The major equipment vendors are starting to establish a reputation for consultancy skills with information systems departments. They may be able to build on this to assist both information systems departments and user management in developing proactive information systems strategies, which could lead to the initiation of systems integration projects.	
B		
The Buying Process	Exhibit II-1 lists three of the key factors which influence the buying process in the systems integration market.	
EXHIBIT II-1	Western European Systems Integration Vendor Selection Factors	
	End-user selection	
	Top management influence	
	Audits/consultancy studies	

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Systems integration projects often arise out of a need to realign information systems in support of the organisation's business focus. This realignment can be necessitated by a changing focus within the business goals of the organisation, or simply a need to update information systems which have not kept pace with the rest of the organisation. Alternatively, it may be desirable to extend the scope of the organisation's information systems into new areas of the business.

On the whole, information systems departments prefer to manage such developments themselves, only outsourcing where necessary in order to overcome resource or skill shortfalls. This means that a large proportion of systems integration projects will be initiated by end-user management, typically top management, rather than by the information systems department.

This trend is being accentuated by the changing nature of the relationship between information systems departments and end users. In many cases, the in-house information systems department is becoming merely one possible supplier of services. End users are receiving greater levels of freedom to choose any supplier they wish for systems advice and development. Accordingly, important factors in the generation of systems integration projects include information systems audits and consultancy studies undertaken by external vendors.

This has important implications for the positioning of vendors seeking systems integration projects.

At present, the management consultancies are best positioned to generate systems integration revenues. The consultancies have considerable credibility with user top management, where they are perceived as having a good understanding of the business issues and the means by which information systems can assist in meeting corporate goals. They are also generally recognised by users as having high-calibre personnel.

The weaknesses of the management consultancies shown in Exhibit II-2 are those perceived by information systems management, and so may not reflect the views of top management. However, the high calibre of their personnel can lead to problems. There is always the danger that unless they are firmly managed by the client, they will specify over-ambitious systems, going beyond the immediate requirements of the client. Without sufficient supervision by the client, it is easy for vendor personnel to believe that they know how to best manage the client's business.

Two companies interviewed in-depth by INPUT had recently cancelled a systems integration project with a management consultancy because of problems in managing the project. In both instances, the apparent cause of the problems was insufficient user involvement in identifying the appropriate trade-off between system cost and functionality.

Another perceived shortcoming of the management consultancies is a tendency to try to prolong projects to generate additional revenues.

EXHIBIT II-2

Western European Systems Integration Perceived Strengths and Weaknesses of Professional Services Vendors

	Weaknesses	Strengths	
ills	Business consultancy skills	Appreciation of business requirements	
	Technical orientation	Develop on time	
		Develop on budget	
		Develop on budget	

As indicated in Exhibit II-3, information systems departments have a much more comfortable relationship with professional services vendors than with the management consultancies. Information systems departments and professional services vendors understand one another, and the information systems departments feel that they can manage their working relationships with professional services vendors.

EXHIBIT II-3

Western European Systems Integration Perceived Strengths and Weaknesses of Professional Services Vendors

Strengths	Weaknesses
Appreciation of business requirements	Business consultancy skills
Develop on time	Technical orientation
Develop on budget	

However, information systems departments prefer to delegate specific tasks to professional services vendors rather than outsource major systems integration projects. But they are confident of professional services vendors' ability to deliver. There is a strong perception that the project management capabilities of professional services vendors have improved considerably in recent years.

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The main weakness of professional services vendors is their poor positioning with user top management, where they are still regarded as companies with good technical skills but more suited to deal with the information systems department than real business issues. Accordingly, they are not likely to be used by user top management to assist them in aligning the organisation's information systems with its business strategies.

The perceived strengths and weaknesses of the major equipment vendors are indicated in Exhibit II-4. One of their major strengths is their overall market presence, which makes them appropriate candidates for serious consideration.

Western European Systems Integration

Perceived Strengths and Weaknesses of Major
Equipment VendorsStrengthsWeaknessesStabilityDepth of resourcesHigh-calibre personnelLack of proven track recordGood consultancy skillsLack of independence

The major equipment vendors are viewed as more supportive of information systems departments than are the management consultancies, and so may be able to use the information systems department as their entry point into user organisations.

They are also increasingly recognised as having good consultancy skills, particularly when they utilise personnel who have worked in their own equivalent internal business functions, for example, manufacturing experts or distribution experts. Using these skills, the equipment manufacturers may be able to involve end-user management, as well as information systems management, and assist in the production of proactive information system strategies. In some cases, this will lead to the identification of the need for systems integration projects.

For more detailed development work, the equipment manufacturers are perceived to lack the depth of resources required. Though the equipment vendors could overcome this perception by establishing their own professional services organisations, this might not be the best approach.

EXHIBIT II-4

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An alternative approach would be for the equipment vendors to concen- trate at the consultancy level and on coordinating the management of third parties to achieve the development aims.
Such an approach might even help in reducing the perception of vested interests, which is another handicap for the equipment vendors.

С

User Satisfaction

Exhibit II-5 contrasts the differing satisfaction levels expressed by information systems departments for systems integration and professional services projects.

Overall, low levels of satisfaction were expressed with systems integration projects. While some bias could be expected from information systems managers, it is clear that a significant proportion of systems integration projects fail. In this study, two information systems managers cited the abandonment of the system integration project initiated in their company.

EXHIBIT II-5

Western European Systems Integration User Satisfaction Levels

Systems integration

Nature of Project

Professional services

High

Degree of Satisfaction

Low - medium

Exhibit II-6 indicates some of the factors thought to be responsible for these project failures.

The main reason for project failures given by information systems managers is inadequate management of the vendor by the client. Large systems integration projects obviously require experienced project management by clients to ensure that their business aims are met. Good project management within the vendor's organisation is insufficient on its own.

This is because the trade-off between system functionality and cost can only be made by the client. Leaving the vendor in control of the specification of the system can lead to over-ambitious or over-complicated proposals which cannot be justified by the client.





Throughout a systems integration project, maintaining a detailed, but flexible, specification is likely to be one of the major difficulties. Obviously a poor initial specification is likely to lead to cost and time overruns, possibly on a large scale. However, there are also dangers in establishing too rigid a specification at the start of a project. Views are bound to change in the light of experience, and the users' business objectives need to take precedence over the initial specification.

The high level of success achieved in professional services projects was attributed to the combination of:

- Detailed agreements, including specifications
- Thorough vetting of vendors' development capabilities
- Strong in-house project management

While this offers some pointers to the requirements necessary to achieve successful systems integration projects, there are important differences between professional services and systems integration projects. A detailed specification can be readily provided at the start of a professional services project. However, it may be unrealistic to expect such a detailed understanding of requirements at the start of a large systems integration project.

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Vendor Issues	Since a considerable proportion of systems integration projects are found to be initiated by end-user management rather than information systems management, the management consultancies are best positioned to take advantage of these opportunities. This is because of the strong percep- tion of their understanding of business issues and their perceived abilities to relate information systems to business strategies.
	The professional services vendors have good working relationships with information systems departments. However, this does not, on the whole, lead to systems integration opportunities since information systems departments prefer to manage these projects in-house.
	The major equipment vendors also have established relationships with information systems departments and are becoming increasingly recognised for their consultancy skills. If they can utilise these, working closely with information systems management to produce proactive information systems strategies, then systems integration projects could result.
	However, winning systems integration projects is not always the most difficult phase. Large systems integration projects will always have a comparatively high risk of failure. Some of the vendor issues are listed in Exhibit II-7.
EXHIBIT II-7	Western European Systems Integration Issues for Vendors
	Robustness of specifications
	User project management capability
	Pricing
	User involvement

Possibly the most important factor leading to successful completion of systems integration projects is firm management of the vendor-client relationship by the client. It is important that this is recognised by both vendors and their clients.

The initial system specification is especially important. The specification needs to be sufficiently detailed to allow the overall project to be accurately costed, yet it also needs sufficient flexibility to permit some modification of ideas as the project progresses. However, above all, the specification needs to accurately reflect the client's functionality/cost trade-offs and to be robust enough not to be rendered obsolete by changes to business practices in the medium term.

User involvement is important, both to ensure end users' commitment to the system once it has been developed and to ensure that the system can be supported by in-house systems development personnel.

The basis for pricing of systems integration projects remains an issue. Users obviously favour fixed-price contracts, but these have their own shortcomings, as listed in Exhibit II-8.

EXHIBIT II-8

Western European Systems Integration Fixed-Price Contracts

Strengths	Weaknesses
Limits user's liability	Ignores evolution of requirements
	Limits vendor flexibility

Ideally the user needs to be able to put an upper limit on the cost of a project while maintaining enough flexibility for the definition of the system to be modified in the light of experience as the project progresses.

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User Perceptions





User Perceptions



Systems integration projects frequently arise as organisations change their business focus and, as a result, need to dramatically realign their corporate information systems. On the other hand, an organisation's information systems simply may not have evolved in recent years and consequently not kept up-to-date with the changes in business practice. In either case, this may lead to a need for a major redevelopment of existing information systems. Of course, systems integration projects can also be concerned with increasing the scope of information systems within the organisation. In some instances, this will be because the technology has itself progressed to the point where new, more-ambitious applications can be introduced. Many of these projects will be seen as the use of information systems for competitive advantage. Examples include the airline system Amadeus and major industrial automation projects.

However, many internal information systems departments are reluctant to transfer responsibility for major projects to external vendors, preferring to subcontract only those elements of the project necessary to overcome resource or skill constraints. Hence the rise in end user autonomy is an important contributory factor in the outsourcing of major projects.

Central government is a major purchaser of systems integration services since it is more favourably disposed to the outsourcing of critical projects than the private sector.

The major reasons for the use of external vendors rather than in-house information systems personnel are listed in Exhibit III-2.



Most internal information systems departments prefer to manage major projects themselves rather than let control pass to an external vendor. Overall, with the exception of the increasing trend towards use of application software products, the major reasons why information systems departments use external vendors are to cover their peak workloads and to meet specific skill deficiencies. For the majority of large commercial projects, the information systems department perceives itself as having an excellent understanding of both the business and the technical requirements of the task and so will manage these projects itself.



Where the information systems department cannot handle the peak development workload in-house, then specific modules—usually accompanied by highly detailed functional specifications—will tend to be subcontracted.

However, if the information systems department perceives itself as lacking the necessary business understanding, then it is probable that the complete project—including specifications—will be outsourced. Areas where this is common include logistics, automated warehousing, and factory automation.

Information systems departments also use external vendors to assist them in managing projects. While all project management responsibility and accountability is retained by the information systems department, the vendor will perform a similar role to a consulting engineer in civil engineering projects. The vendor will typically assist the user in producing a detailed specification and documentation, and then assist in the evaluation of suppliers. Once the project is under way, the vendor may be retained as an adviser, but without any direct project management responsibilities.

For the majority of systems integration projects undertaken by systems integration vendors, the decision to use an external vendor will have been taken by end users rather than the information systems department. This is particularly true of commercial projects where both the business processes and the technology are well understood by the information systems department.

DRole of ExternalVendorsThe detailed roles for wh
shown in Exhibit III-3.

EXHIBIT III-3

B

The detailed roles for which software and services vendors are used are shown in Exhibit III-3.

Role of External Vendors

Activity Performed by Vendor	Number of Users	
Business study	2	
Functional specification	4	
Project management	4	
Program development	8	
Sample of eight users		

While most users actively utilise software and services vendors to assist their software development activities, few information systems departments are prepared to hand over control of business studies to external vendors. Indeed, external vendors were involved in project management and the development of functional specifications in only half of the companies interviewed.

This reluctance to subcontract project management and specifications to vendors is typically supported by a range of anecdotes describing the project failures which have resulted from such actions in the past. Indeed, the press continues to provide evidence in support of such prejudices with constant examples of major projects which have either dramatically exceeded budget, overrun by years, or been cancelled because of a defect in their specification. Recent examples of such projects include a system for the Department of Social Security in the U.K. where costs are reported to have risen threefold and the EFTPOS project which was overtaken by changing market requirements. While most of the examples cited in the press relate to the public sector, similar failures also exist in the private sector, though these tend to receive little publicity.

As a result, a number of major financial institutions insist that they are only prepared to use junior staff from software and services vendors for activities such as software development.

However, it is clear that the role of in-house information systems departments is starting to change in the manner shown in Exhibit III-4.

A significant proportion of user information systems departments are moving to an information systems planning role in which the emphasis is on identifying business requirements, followed by selection and monitoring of an appropriate software and services vendor. Accordingly, the emphasis on software development within such information systems departments is steadily decreasing.

In other instances, information systems departments are becoming more focused in the areas they handle. For some types of systems, all development work will be performed in-house, and for others, complete projects will be outsourced to software and services vendors.

EXHIBIT III-4



Retain control of major projects	5
Moving to vendor management role	3

Sample of eight users in Western Europe

However, many in-house information systems departments are not readily reducing their influence over the systems produced. Typical arguments used by information systems departments to retain control include:

- It is important that accountability remains within the company.
- End users lack the ability to manage projects and external vendors.
- The in-house department understands the company's needs better than any external vendor.

- We have tried using external vendors in the past—the quality was poor.
- We can deliver at one-third of the cost of an external vendor.
- Our systems are highly integrated—it is difficult to carve out a standalone system to give to the vendor.

The nature of the changes to the role performed by the information systems department owes much to the changing nature of the relationship between the information systems department and its end users. The changing role of the information systems department is typified by the following comments from information systems managers:

- "We no longer have a divine right. Contracts with user departments are becoming more formal."
- "Users can do what they like, they don't have to tell the information systems department. We have relationship managers to handle this."

Overall, the information systems department is typically becoming more akin to an external vendor, though one with privileged access to end-user management. Charging out for in-house services is becoming more commonplace, and the information systems department is taking on more of an advisory, systems coordination role.

The relationship between end users and information systems departments is also becoming more formal, with more detailed agreement on deliverables taking place. This can lead to better management of projects.

The increased freedom of users to approach external vendors, in many cases without the formal constraint of informing the information systems department, has led to active account management by information systems departments that now need to be more proactive in anticipating end user requirements.

A measure of the overall willingness of information systems departments to use external vendors for systems integration projects is shown in Exhibit III-5.

The majority of information systems departments do not wish to use systems integrators for major projects, though there is increasing scope for these departments to be overruled by their end users.
Willingness of Information Systems **Departments to Use Systems Integrators**

Attitude	Number of Users			
Will use	3			
Will not use	5			
Sample of eight upper in Mestern Europe				

Sample of eight users in western Europe

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Vendor Strengths and Weaknesses

1. Major Equipment Vendors

Some typical user attitudes towards the use of the major equipment vendors for major projects are listed in Exhibit III-6. Exhibit III-7 shows the perceived strengths and weaknesses of major equipment vendors.

EXHIBIT III-6

Western European Systems Integration User Attitudes to Use of Major Equipment Vendors "The calibre of their personnel varies widely." "Those staff who have worked on the equipment vendor's internal systems are very good." • "I wouldn't use them for IS strategy studies. These should not be linked to the hardware." "We would evaluate their expertise the same as for any other vendor. One advantage is that they will be there tomorrow." • "They lack a proven track record."

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Western European Systems Integration Perceived Strengths and Weaknesses of Major Equipment Vendors

Depth of resources
Lack proven track record
Vested interests

Overall, attitudes to the use of the major equipment vendors are mixed, but most companies are prepared to evaluate their services alongside those of their more traditional suppliers. A major factor here is the perceived stability of this category of vendor, and the high likelihood of their continued presence in the market.

The major equipment vendors are increasingly recognised as having very capable personnel for assistance with consultancy studies, with a particular mention being made of personnel who have worked on equivalent internal systems within the manufacturer's business. However, one major drawback is users' fear of vested interests and of committing themselves to the constraints of a single hardware vendor policy. This may not be a major handicap where users' information strategies are already largely committed to equipment from a single vendor.

For more detailed development work, users expressed concern about the major equipment vendors' lack of track records and the depth of their personnel resources. Many users are familiar with the difficulty of locating personnel with specific skills within their equipment vendor's organisation. For example, one user suggested that it was very difficult to find vendor personnel who knew how to connect a personal computer to a minicomputer. This implied that project teams might be put together on a very ad hoc basis, with personnel drawn from many different areas of the vendor. Users would prefer a stable organisation to be set up by the vendor, offering continuity of personnel and service.

2. Management Consultancies

The influence of the management consultancies lies behind the initiation of some of the more ambitious systems integration projects attempted in recent years.

In terms of their consultancy capabilities, they are perceived as having some very capable, if expensive, personnel. These consultants have a high degree of credibility with user top management, and will often be seen as having a better appreciation of the business issues involved than the in-house information systems department. However, within information systems departments, the management consultancies do have a reputation of working to set patterns and producing standard solutions almost irrespective of the organisation's individual circumstances. Overall attitudes to the use of management consultancies for systems integration projects are listed in Exhibit III-8, and their perceived strengths and weaknesses in Exhibit III-9.

EXHIBIT III-8



Western European Systems Integration Perceived Strengths and Weaknesses of Management Consultancies

Strengths	Weaknesses
High-calibre personnel	Expensive
Credibility with user top management	Sometimes overrun cost and timescales
	Looking for repeat business

The high calibre of staff employed by these vendors, and their emphasis on working with top management, can lead to problems on occasion. There is sometimes a danger of the consultancy believing its own personnel know what is best for the client and not liaising adequately with either the end users or personnel from the information systems department. The resulting lack of control can lead to changing, or over-ambitious, specifications that can result in increased cost or timescales.

Several of the companies researched in the course of this survey had initiated multimillion dollar projects with management consultancies in the past, only for these to be abandoned after considerable sums had been spent.

The management consultancies were also criticised for looking for additional business towards the end of projects, which made it difficult for users to bring projects to a clear end point.

3. Professional Services Vendors

Exhibit III-10 shows user attitudes towards the use of professional services vendors while Exhibit III-11 lists their perceived strengths and weaknesses.



EXHIBIT III-11

Western European Systems Integration Perceived Strengths and Weaknesses of Professional Services Vendors

Strengths	Weaknesses
Appreciation of business requirements	Business consultancy skills
Develop on time	Technical orientation
Develop on budget	

On the whole, the professional services vendors seem to have good working relationships with in-house information systems departments. The two groups appear to understand one another, and the information systems departments know that they can manage the professional services vendors. However, this does not necessarily mean that information systems departments are prepared to subcontract systems integration projects to these vendors. On the whole, they prefer to delegate specific tasks to professional services vendors with detailed briefs. On this basis, they are confident of professional services vendors' ability to deliver against the agreed schedule. There was a strong perception that professional services vendors have improved their project management capabilities markedly in recent years.

The main weakness of the professional services vendors is that they are still perceived mainly as implementors with good technical skills. Accordingly, user top management does not perceive them as appropriate organisations to assist in clarifying how information systems relate to the organisation's overall business strategy.

4. Implications

The management consultancies will continue to be perceived as the appropriate type of vendor to assist user management in improving its business strategies. Often it will only become clear that information systems need to be realigned once a more general review, and possibly revision, of the complete business strategy of the organisation has been conducted.

This can leave the professional services vendors poorly positioned to tackle systems integration projects compared to the management consultancies.

Exhibit III-12 contrasts the vendor selection criteria between professional services and systems integration projects. While information systems departments are the primary buying influence for professional services projects, much systems integration activity by-passes the in-house information systems department.

Many commercial systems integration projects arise as a direct result of a top management decision. For example, the business might be changing its focus or the company might employ consultants to review the capability of the company's existing information systems to support its business aims.

The most important factors in the choice of vendor will be the vendor's ability to understand the business and the issues it is likely to face in the future from a top management perspective. Comparatively little attention may be paid to evaluating the development capabilities of the vendor.

Western European Systems Integration Factors in Vendor Selection

Nature of Project	Key Factors
Systems integration	Board level decisions
	Spin-offs from audits/studies
	Vendors judged on strategic capabilities
	Limited evaluation of implementation skills
Professional services	Experience of vendor
	Detailed evaluation of capabilities
	Location

On the other hand, a typical information systems department seeking a vendor to carry out specific software development work will evaluate each potential vendor's capabilities in some detail. The information systems department will typically know of the capabilities of many of the major professional services vendors and will have experience of using their services previously. Vendors not used previously will frequently be given a small project initially to test their capabilities. For each new project, the information systems department is likely to interview the vendor's proposed project manager in some depth, request the CVs of all personnel involved in the project, and possibly take references from the vendor's client base. The location of the vendor can also be an important factor, since vendor and client personnel need to work closely together and this is obviously aided by physical proximity.

D

User Satisfaction

As illustrated in Exhibit III-13, there is a marked contrast in the degree of satisfaction reported by users between large systems integration projects and smaller professional services projects.

Overall, respondents indicated comparatively low levels of satisfaction with systems integration projects. While it is to be expected that information systems management may be biased in their acceptance of projects initiated outside their domain, it remained comparatively simple for many managers to cite examples of failed systems integration projects within their own organisations.

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Western European Systems Integration User Satisfaction Levels

Nature of Project	Degree of Satisfaction
Systems integration	Low - medium
Professional services and turnkey systems	High

Even where systems integration projects had been initiated by external vendors with the cooperation of the in-house information systems department, failures still occurred.

On the other hand, a high level of satisfaction was expressed concerning professional services projects.

Exhibit III-14 lists some of the major factors which contribute to the failure of systems integration projects.

EXHIBIT III-14

Western European Systems Integration Why Projects Fail: User Perceptions

- Inadequate user involvement
- User unable to manage vendor
- Specifications unclear
- Vendor "knows best"

It is clear that where a systems integration vendor has been appointed to carry out a major development by a user's top management, this weakens the ability of the in-house information systems department to contribute to the management of the project. Unless the end-user department has the skills and can spare the resources to manage the project, this leaves the vendor effectively unmanaged by the client. This danger is particularly prevalent if the proposed system is a companywide one, so that no single end-user department can effectively take responsibility. However, the detailed development work is not usually a cause for concern with systems integration projects. The main problem area is typically the specification of the system.

A vague outline specification leads to problems since it will give too imprecise a definition of the work to be carried out, typically leading to cost increases and delays in development timescales.

Ideally a specification needs to be fairly precise, yet allow some degree of flexibility for change, and to be robust in the medium term. Companies' planning horizons and product life cycles are continually decreasing. Any specification for a system being developed over a period of years needs to be robust enough to adapt to changing products, business approaches, and organisations. Many large projects, such as the EFTPOS scheme, have been abandoned because they have been rendered obsolete by changing external circumstances.

While it is essential that the end users be adequately involved both in the initial specification and its subsequent evolution, it is also important that top management review the features proposed. This is to ensure that all the items proposed are cost-effective and features are not incorporated without commercial justification. Failure to do this will lead to system inflexibility and a considerable increase in costs.

If not properly managed by the client, there is always a danger that vendors will over-elaborate on systems design and impose their own beliefs on the way the client's business should be run. To avoid these pitfalls, it is essential that systems integration projects be strongly managed by the client, as suggested in Exhibit III-15.

EXHIBIT III-15

Western European Systems Integration Why Project Succeed: User Perceptions

- Strong management by user
- Accountability retained by users
- Detailed agreement
- Regular monitoring

Detailed agreements between the vendor and the client are increasingly seen as the key to successful management of projects, the development of the system being monitored against strict timescales, costs, and functionality. However, clients cannot afford to be too rigid in defining the initial specification. Projects have been known to fail, even though they met the above criteria, because the initial specification given to the vendor turned out to be flawed. Accordingly, it is important throughout the project to monitor the user's business objectives and to show a degree of flexibility in meeting them.

It is also essential that the client be professional in its approach to the project and provide the necessary levels of cooperation to the vendor. This is best achieved by making individual client personnel accountable for the project in terms of its cost, delivery date, and relevance to the organisation's needs. Client personnel should then manage the vendor to achieve these aims. This requires the agreement of detailed project plans and the review of progress and quality of work on a frequent and regular basis.

When purchasing professional services, users reported greatest levels of success when a very detailed specification was produced and development was closely managed by the in-house personnel.

The visibility of systems integration project failures is one of the factors suppressing the adoption of systems integration, as illustrated in Exhibit III-16.



	While the private sector is typically loathe to announce its failures, failures in the public sector receive considerable media coverage. In the United Kingdom, it has been suggested that more than half of the systems integration projects initiated by central government fail to come within sight of their objectives. Recent examples include:
	 Passport Issuing and Management Information System - The original specification is reported to have contained a number of flaws.
	 Foreign Office London Integrated Office System
	 Department of Social Security - Development costs are estimated to have trebled the initial estimates.
	Many other examples of comparatively unsuccessful projects can be found within the defence and health sectors.
	All of these examples fuel the case of in-house information systems departments that, on the whole, prefer to manage large projects in-house, countering any resource or skill shortfalls by subcontracting specific elements of the overall project.
•	Another argument used by information systems departments is the diffi- culty in interfacing systems developed by external vendors with their own highly integrated environment.
	By their nature, systems integration projects tend to be both high value and high risk. This means that they are particularly vulnerable to eco- nomic conditions and, in the current business climate, many large sys- tems integration projects are being postponed indefinitely.
E	
Case Study—Systems Integration Project	Exhibits III-17 and III-18 chart the course of a recent systems integration project. The user (Company X) operates in the service sector and is a major subsidiary of a multinational conglomerate operating in Western Europe. The vendor is referred to as Vendor Y to protect the company's anonymity.
	The project arose as a result of Vendor Y being commissioned to under- take an audit of the effectiveness of information systems throughout the subsidiaries of the conglomerate.
	Vendor Y concluded in the course of this audit that the information systems within Company X had not kept pace with the development of the organisation, which in recent years had been showing strong growth. Since Company X is a service business, its information systems are required to play an important role both in assisting the management of the business and in supporting the delivery of its services to clients. In this

sector, information systems are an important determinant of the quality and range of customer service which can be provided. Accordingly, it was agreed that a major redevelopment of Company X's information systems was required and that Vendor Y would assist in this process.



Vendor Y then produced a business study to be used as the basis for an invitation to tender to be sent to a number of major vendors. The scope of the redevelopment—a multimillion dollar bespoke development supporting a considerable end-user population—was clearly seen to be beyond the capabilities of the medium-sized in-house information systems department.

At this stage, Vendor Y requested that it too be allowed to tender for the project. Bids were received from a number of major systems integration vendors, though one vendor declined to tender on the basis that the specification contained within the invitation to tender was too vague to permit a fixed-price bid to be submitted. Other vendors submitted fixed-price bids as requested, in some instances making allowances for the vagaries of the invitation to tender. However, the lowest bid received came from Vendor Y, which duly won the contract to develop the system.

Vendor Y now completed its formal functional specification. This was done not within the constraints of the business study, which had included only limited functionality, but by thorough interviewing of end users. The result was a "wish list" which went far beyond the scope of the original business study and substantially increased the functionality required.

Vendor Y reasoned that this additional functionality was not referred to within the original study, and so the cost of providing it was additional to the fixed price already negotiated. The difference was considerable.

However, to reduce the overall cost to Company X, Vendor Y proposed that Company X purchase the major equipment items direct from the supplier and take advantage of the large discount available. Unfortunately, this would mean that Vendor Y would no longer be in a position to guarantee the response times specified in the initial contract, since they would no longer be responsible for the equipment.

Vendor Y also explained that it would be much cheaper if it developed the software off-site. The invitation to tender had stressed the importance of on-site development to ensure high levels of contact between vendor and client personnel. Company X was now beginning to have misgivings concerning the depth of Vendor Y's expertise in the technology being used for software development and to worry about technology transfer to in-house personnel.

Company X was also starting to realise that it, not Vendor Y, was responsible for managing the changeover from the existing information systems to the new ones.

At this point, with the project costs escalating and the likelihood of successful implementation diminishing, Company X cancelled the project.

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Exhibit III-19 lists some of the major issues that arise from this case study.

EXHIBIT III-19 Case Study—The Issues • Vendors cannot police themselves • User management must control functionality • Close links between users and vendor personnel • Technology transfer

> To the client, the major issue was not the vendor's bidding against its own invitation to tender, or even the rapid escalation of costs on what was supposedly a fixed-price contract, but the vendor's failure to point out to the client that the client did not have the capability to manage the supplier.

In particular, it is clearly essential in this case that the user management decide the appropriate level of functionality. Leaving this decision to the vendor is clearly unsatisfactory. Also, it is not good practice for development to take place without close involvement of user staff. This is needed both to regularly review the functionality being implemented and to monitor progress against the budget and schedule.

In this case, the user also felt that it was important to include in-house information systems personnel within the development project team, to ensure that adequate knowledge of the system was built up within the client's organisation. A more satisfactory arrangement for implementation and changeover to the new system, with the vendor taking more responsibility, is needed to bring the project to a successful conclusion.

F Pricing Issues

The basis for pricing systems integration projects remains problematical. Few users are prepared to adopt a time and materials approach for areas other than the preparation of business studies and outline specifications. Fixed-price contracts are more acceptable to users, though these also have their drawbacks, as indicated in Exhibit III-20.

Western European Systems Integration Fixed-Price Contracts

Strengths	Weaknesses
Limits user's liability	Ignores evolution of requirements
	Limits vendor flexibility

Fixed-price contracts are perceived by users to be most successful where user requirements are accompanied by very detailed specifications. However, this is not always possible in large projects, and a very tightly defined specification limits the vendor's flexibility to meet evolving business needs.

Another problem with fixed-price contracts is that there is no incentive for vendors to finish a project ahead of schedule, having used fewer resources than were initially proposed.

One pricing structure which has been suggested to counter these problems with fixed-price contracts involves:

- Paying the vendor the profit element, but not the cost element, on any work not required up to the value of the fixed-price contract
- Paying the vendor just the cost element, but not the profit element, for any work in excess of the fixed-price contract

While this approach is not perfect, it does provide an incentive for vendors to reduce the length of projects, while not totally penalising them for introducing necessary additions to the system's functionality.



Implications for Vendors



Implications for Vendors

Given the importance of user top management in the buying process for systems integration projects, the management consultancies are well positioned to target this market. The professional services vendors have good working relationships with user information systems departments, but the extent to which they can reposition themselves to generate systems integration business is questionable.

The equipment vendors are developing a reputation for their consultancy skills with information systems management. They may be able to utilise this expertise to assist information systems management in developing proactive systems strategies in support of business goals. This could in turn lead to their involvement in systems integration projects.

However, systems integration projects remain difficult to implement successfully and a large number of projects are abandoned by users. Some of the principal factors behind project failures are listed in Exhibit IV-1, and some of the resulting issues which need to be addressed by systems integration vendors are presented in Exhibit IV-2.

The major cause of failure in systems integration projects is perceived to be inadequate involvement of the client in the specification and monitoring of the project. While vendors may not always accept this, it is in their best interests to encourage firm project management by the client. It is likely to lead to problems if the vendor takes on too much responsibility for the system and starts to make its own assumptions about how the client's business should best be run.

In particular, it is important that the client accept ownership for the system specification. Only the client can be sure that the proposed system will address the relevant business objectives and make the correct trade-offs between cost and functionality.

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User involvement is also necessary to ensure that the project holds no surprises for the client and that an effective transfer of the technology from the vendor to the client takes place.



Appendixes

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Definition of Terms

Α	
Overall Definitions and Analytical Framework	Information Services - Computer/telecommunications-related products and services that are oriented toward the development or use of informa- tion systems. Information services typically involve one or more of the following:
	 Processing of specific applications using vendor-provided systems (called Processing Services)
	• A combination of hardware, packaged software and associated support services which will meet a specific application processing need (called Turnkey Systems)
	• Packaged software (called Software Products)
	• People services that support users in developing and operating their own information systems (called Professional Services)
	• Bundled combinations of products and services where the vendor assumes responsibility for the development of a custom solution to an information system problem (called Systems Integration)
	• Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called Systems Operations)
	• Services associated with the delivery of information in electronic form-typically network-oriented services such as value-added networks, electronic mail and document interchange, on-line databases, on-line news and data feeds, videotex, etc. (called Network Services)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is bundled as part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., EDI or VAN services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the **Information Services Industry** consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels, and competitive issues.

All **Information Services Market** forecasts are estimates of **User Expenditures** for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Market Sectors or markets, are groupings or categories of the users who purchase information services. There are three types of user markets:

- Vertical Industry markets, such as Banking, Transportation, Utilities, etc.
- Functional Application markets, such as Human Resources, Accounting, etc. These are also called "Cross-Industry" markets.
- Generic markets, which are neither industry- nor application-specific, such as the market for systems software.

Specific market sectors used by INPUT are defined in Section D, below.

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors which have a different parent corporation than the user. It is these expenditures which constitute the information services market.

Delivery Modes are defined as specific products and services that satisfy a given user need. While Market Sectors specify who the buyer is, Delivery Modes specify what the user is buying.

Of the eight delivery modes defined by INPUT, five are considered primary products or services:

- Processing Services
- Network Services
- Professional Services
- Applications Software Products
- Systems Software Products

The remaining three delivery modes represent combinations of these products and services, bundled together with equipment, management and/or other services:

- Turnkey Systems
- Systems Operations
- Systems Integration

Section B describes the delivery modes and their structure in more detail.

Outsourcing is defined as the contracting of information systems (IS) functions to outside vendors. Outsourcing should be viewed as the opposite of insourcing: anything that IS management has considered feasible to do internally (e.g., data centre operations, applications development and maintenance, network management, training, etc.) is a potential candidate for outsourcing.

IS has always bought systems software, as it is unfeasible for companies to develop it internally. However, all other delivery modes represent functions or products that IS management could choose to perform or develop in-house. Viewed this way, outsourcing is the result of a makeor-buy decision, and the outsourcing market covers any product or service where the vendor must compete against the client firm's own internal resources.

Industry Structure and 1. Service Categories

Delivery Modes

B

The following exhibit presents the structure of the information services industry. Several of the delivery modes can be grouped into higher-level **Service Categories**, based on the kind of problem the user needs to solve. These categories are:

- Business Application Solutions (BAS) prepackaged or standard solutions to common business applications. These applications can be either industry-specific (e.g., mortgage loan processing for a bank), cross-industry (e.g., payroll processing), or generic (e.g., utility time-sharing). In general, BAS services involve minimal customisation by the vendor, and allow the user to handle a specific business application without having to develop or acquire a custom system or system resources. The following delivery modes are included under BAS:
 - Processing Services
 - Applications Software Products
 - Turnkey Systems
- Systems Management Services (SMS) services which assist users in developing systems or operating/managing the information systems function. Two key elements of SMS are the customisation of the service to each individual user and/or project, and the potential for the vendor to assume significant responsibility for management of at least a portion of the user's information systems function. The following delivery modes are included under SMS:
 - Systems Operations
 - Systems Integration

Each of the remaining three delivery modes represents a separate service category:

- Professional Services
- Network Services
- System Software Products

Note: These service categories are a new concept introduced in the 1990 MAP Program. They are purely an aggregation of lower level delivery mode data. They do not change the underlying delivery modes or industry structure.

2. Systems Integration (SI)

Systems Integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of cost must be associated with information systems products and/or services.

The systems integrator will perform, or manage others who perform, most or all of the following functions:

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed systems design and architecture
- System component selection, modification, integration and customisation
- Custom software design and development
- Custom hardware design and development
- Systems implementation, including testing, conversion and postimplementation evaluation and tuning
- Life cycle support, including
 - System documentation and user training
 - Systems operations during development
 - Systems maintenance
- Financing

3. Professional Services

This category includes consulting, education and training, and software development.

- Consulting: Services include management consulting (related to information systems), information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of information systems, including equipment, software, networks and systems operations.
- *Education and Training:* Products and services related to information systems and services for the professional and end user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation.
- Software Development: Services include user requirements definition, systems design, contract programming, documentation and implementation of software performed on a custom basis. Conversion and maintenance services are also included.



Related INPUT Reports

Systems Operations Market Analysis and Forecast—Western Europe, 1990-1995 Systems Operations Vendor Issues—Western Europe, 1990-1995 Systems Operations User Issues—Western Europe, 1990-1995 Systems Integration Market Forecast—Western Europe, 1990-1995 Systems Integration Vendor Issues—Western Europe, 1990-1995

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Systems Integration Questionnaire– User Issues

This questionnaire relates to major projects where overall project management responsibility is held by an external vendor. The project should involve either the writing of custom software or extensive modification of a software package.

1. How did the systems integration project arise?

2. Why did you decide to use an external supplier for this project?

3. Who did you select as prime contractor?

Why?

4. Would you please rate the suitability of each of the following types of vendors as prime contractors for major projects?

	Not At All			Very	
Major Equipment Vendor	1	2	3	4	5
Middle Ranking Equipment Vendor	1	2	3	4	5
Major Professional Services Vendor	1	2	3	4	5
Software Products Vendor	1	2	3	4	5
Management Consultancy	1	2	3	4	5
Other	1	2	3	4	5

Why do you feel each category of vendor is appropriate or inappropriate to conduct systems integration projects?

5. How satisfied are you with the work so far on this project?

Not At All		Very			
1	2	3	4	5	

Which aspects of the service are you most pleased with?

Which aspects of the service are you least pleased with?

- 6. Who was responsible for appointing the prime contractor?
 - □ Information Systems Department
 - □ General Management
 - □ User Management
 - □ Committee of Above
 - □ Other _____
- 7. Did the project arise as the result of a business consultancy study performed by the vendor?
 - \Box Yes \Box No
- 8. How many vendors were asked to tender for the project?

Thank you very much for your assistance.

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