

Information Systems Outsourcing: Issues and Evidence

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According to the popular press, outsourcing is becoming pervasive in the marketplace. The primary philosophical question 'whether outsourcing is specific to information systems functions or is it as widespread as being publicized' remains unanswered. Are we reliving the 'hollowed out' corporation or is it just another fad that will pass away? Is there any proof that corporations are becoming 'virtual' — that is, one or a few managers forming a company and outsourcing almost everything to outside companies. This paper looks at the potential risks and benefits of outsourcing and presents some statistics on outsourcing. It then lists the research issues covered in the literature, followed by a content analysis of the annual reports of 31 companies (25 clients and six vendors). It attempts to determine the perceived value of the outsourcing activity based on how the outsourcing information is communicated to the shareholders. Finally, the paper discusses the relationship (or lack thereof) between productivity and outsourcing.

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Introduction

Information system (IS) 'outsourcing' is an act of subcontracting a part, or all, of an organization's IS work to external vendor(s), to manage on its behalf. Being a core activity, outsourcing of IS functions is usually viewed as much more than a simple service contract. While legal contracts have to be used, the spirit of outsourcing is one of partnership, strategic alliances and long-term relationships between the vendor(s) and client firms.¹

The current informal literature cites arguments both for and against outsourcing of information services. In their study, Ketler and Walstrom² classified outsourcing advantages and disadvantages on personnel, economic, control, data/segment and organizational dimensions (Tables 1 and 2).

The potential benefits and risks of outsourcing indicate that there is a need for better understanding of this phenomenon. Understanding of various issues will help management make knowledgeable decisions about outsourcing. The remainder of the paper is organized as follows: the extent of IS outsourcing is explored; the outsourcing related issues are discussed; the content analysis in establishing the value of outsourcing is presented; and the relationship between performance and outsourcing is explored.

Outsourcing statistics

Outsourcing is a rapidly growing phenomenon. The 1990 worldwide outsourcing market is estimated to be \$30 billion, and is projected to grow to \$50 billion by 1995.³ A recent survey by Ledgeway Group Inc. estimated that US firms would spend about \$24 billion on outsourcing activities for their IS groups in 1990.⁴ And it is expected to more than

¹HUFF, S.L. (1991). Outsourcing of information services. *Business Quarterly*, Spring, pp. 62–65.

²KETLER, K. AND WALSTROM, J. (1993). The outsourcing decision. *International Journal of Information Management*, 13 (No. 6), pp. 449–460.

³TERESKO, J. (1990). Make or buy? Now it's a data processing question too. *Industry Week*, 16 July, pp. 54–55.

⁴RICHMOND, W.B., SEIDMAN, A. AND WHINSTON, A.B. (1992). Incomplete contracting issues in information systems development outsourcing. Working paper (to appear in *Decision Support Systems*).

Table 1. *Advantages of outsourcing*

	Advantages
Personnel	Increased knowledge and expertise Alternative to staff increases for short term projects
Economic	Cost savings Increased return on equity
Control	Share the risk Elimination/reduction of the weakness of the MIS department
Data/segment	Outsource the non-strategic Focus attention on the strategic
Organizational	Outsource the weakness of the MIS department Applicable to the procedurally oriented organizations

double by 1995, with the projected compounded annual growth for most major industries to be between 12 and 23 per cent.⁵ Somewhat different figures are given by Kirkpatrick,⁶ who states that US businesses spent \$7.2 billion on outsourcing of computer operations in 1990, and that by 1995 the annual amount will more than double to \$15.2 billion (source: Input, a computer market research firm in Mountain View, CA, USA).

Some analysts predict that the expenditures on facilities management outsourcing will double from \$5.9 billion in 1989 to \$12.9 billion in 1994.⁷

Some industry examples

⁵RADDING, A. (1991). The economics of outsourcing. *Bank Management*, September, pp. 20–27.

⁶KIRKPATRICK, D. (1991). Why not farm out your computing. *Fortune*, September.

⁷WELDER, D. (1989). Growing interest in outside services. *Computerworld*, 9 October, p. 18.

⁸ANON. (1991). Ernst and Young's survey of retail information technology expenses and trends. *Chain Store Age Executive*, September, section 2.

*Retail industry:*⁸ A survey of 154 retail companies (33 companies with annual revenue of \$1 billion or more, 22 between \$400–999 million, 49 between \$100–399 million and 50 companies with less than \$100 million) reports that 20 per cent were planning to downsize IS operations through outsourcing. It states that the best candidates are companies with ageing systems and those which are in a weakened financial position. The survey also shows that 62 per cent of those companies currently planning to outsource are considering outsourcing systems development — especially those companies having difficulties with

Table 2. *Disadvantages of outsourcing*

	Disadvantages
Personnel	Loss of in-house expertise Severance cost for termination/transfer of existing IS staff
Economic	Higher than expected outsourcing bills Increased tax liability Decreased profit margin Hidden costs
Control	Loss of control over: <ul style="list-style-type: none"> • Quality of IS services • Disaster recovery • Confidentiality
Data/segment	Determination of strategic non-strategic Confidentiality/security
Organizational	Loss of control in vertically integrated organizations Outsourcing requirements in dynamic organizations may be difficult to contract The extent of end user computing and the ability to keep the users happy

computer-aided software engineering (CASE) tools and information engineering. Outsourcing could reduce their time, cost and risk associated with systems development.

*Commercial banking industry:*⁹ A recent Ledgeway/Dataquest report predicts that the commercial banking industry's outsourcing expenditures will double from 1990 costs to about \$3 billion annually by 1995 (facilities management, application development and network support are the primary outsourced activities). That would make banking the fourth largest in outsourcing expenditures, behind discrete manufacturing, state government and distribution.

Specific examples of outsourcing

Although outsourcing has existed in one form or another for many years (for example data centres and time-sharing bureaus), the recent announcements of major outsourcing contracts have renewed interest in this field. Kodak's announcement of its operating agreements with IBM, DEC and Businessland (lately acquired by Jamaica Water Properties Inc.) brought outsourcing into the limelight. The list of major outsourcing contracts continues to grow and Table 3 shows the leaders in this league.

From a quick analysis of the available information on the terms of these contracts, three salient features identified are: the long-term nature of the contracts, variety of vendors and broad spectrum of activities being outsourced.

General Dynamics' contract with Computer Sciences Corporation (CSC) surpasses all others in both size and scope. General Dynamics contracted its entire IS function, including applications development, to CSC.¹⁰

Research issues related to IS outsourcing

Outsourcing is accepted as a growing trend in the IS area. For management it seems to be a way to cut costs and improve quality at the same time. But is it that simple? Do we know enough about this option to make good decisions? There are many issues yet to be understood and resolved. This section covers some research issues and the work being done on them.

Does outsourcing create value for the firm?

One guiding force for the top management of firms is to make decisions which enhance the value of the firm. One accepted way to measure the value of the firm is by the stock price for the firm. Thus an act which increases the share price of a firm increases the value of the firm. Radding¹¹ quotes from a source that 'As early as 1991, the market has responded by bidding up the share price (of banks that enter outsourcing arrangements) by 60 per cent, relative to their peers'. Reports in McLellan,¹² show results of an event study analysis done on stock prices of 30 companies for which significant outsourcing contracts had been announced in the 1985-90 time period. The study found statistically significant excess returns on announcement days for such stocks and concluded that the market does place a premium on a move to outsourcing.

⁹*Op. cit.*, Ref. 5.

¹⁰WILDER, C. (1991). Giant firms join outsourcing parade. *Computerworld*, 30 October.

¹¹*Op. cit.*, Ref. 5.

¹²MCLELLAN, K. (1991). MIS outsourcing, organizational networks, and competitive advantage. Working paper, School of Business Administration, The University of Western Ontario, London, Canada.

Table 3. Examples of major outsourcing contracts

User company	Outsourcing vendor	Type of activity outsourced	\$ Amount (millions)	Contract year	Initial contract duration	References (listed at foot of table)
American Savings of Stockton (CA)	FiServ	Entire data processing operation	100	1990	7 years	1
American Standard	Genix & McDonnell Douglas	Data centre operations		1989	5 years	2
Armco Advanced Materials Co.	Genix group			1993	5 years	3
Armco Steel	ISSC (IBM subsidiary)	Entire IS function		1993	10 years	4
BankSouth	IBM	Data centre operations		1989	10 years	5
Bethlehem Steel	EDS		500	1992	10 years	6
Blue Cross/Blue Shield of Mass.	EDS	Entire IS function (some joint application development)	800	1992	10 years	7
Blue Cross/Blue Shield of New Jersey	ISSC (IBM subsidiary)		52	1992	5 years	8
Borland Int. Inc. & Wordperfect Corp.*	Corel Corp. (Canada)	Technical support		1993		9
British Petroleum Co.*	Syncordia (British Telecom sub.)	Data, voice and video communications	60	1993	5 years	10
California Republic Bank	Unisys	Entire IS Operations	56	1992	10 years	11
Canada Post*	Andersen Consulting, DMR Group, SHL Systemhouse	Various DP Systems		1991/92		12
Chase Manhattan Bank NA	ISSC (IBM subsidiary)			1993		13
Continental Airlines	EDS	Entire IS function	2100	1990	10 years	14
Continental Bank Corp.	IBM	Data centre and network operations	700	1991	10 years	15
Cullen/Frost Bankers	Systematics	Facilities management		1989		16
Dallas County	Systems and Comp. Tech.		35	1992	7 years	17
Del Monte Foods	EDS	Entire IS function	150	1992	10 years	18

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Table 3. *Continued*

User company	Outsourcing vendor	Type of activity outsourced	\$ Amount (millions)	Contract year	Initial contract duration	References (listed at foot of table)
Dial Corp. (Greyhound Sub.)	Andersen Consulting	Data centre operations		1989	5 years	2
Duracell	Genix	Facilities management	11	1990	5 years	16
Eastman Kodak	IBM	Data centre operations	500	1989	5 years	19
	DEC Businessland	Communications P.C.				
Enron	EDS	Data centre operations and software integration	750	1988	10 years	20
Equifax Inc.	ISSC (IBM subsidiary)	Entire IS operations	650	1993	10 years	21
Europcar*	Perot Systems	Entire IS operations	450	1992	10 years	14
FAA	EDS		508	1992	5 years	22
First American Bankshares, Inc.	Perot Systems	Data centre operations	400	1991		15, 23
First City Bancorp of Texas	EDS	Data centre operations	600	1988	10 years	20
First Fidelity Bankcorp	EDS	Software development and system integration	450	1990	10 years	24
First Tennessee National Bank	IBM	Entire IS except software development		1989	4 years	16
Freeport-McMoRan	EDS	Data centre operations	200	1988	10 years	2
General Dynamics	Computer Sciences Corp.	Entire IS function (except for applications development for some defined projects)	3000	1991	10 years	15
The George Washington University, DC	Systems and Comp. Tech. Corp.	Academic and administrative computing	42	1991	5 years	25
H.J. Heinz Co.	Genix Corp.	Data centre operations	15	1989	5 years	20, 24
Harvest Foods, Inc. (Little Rock, AR)	ISSC (IBM subsidiary)	Entire IS operations		1992		26
Hertz Co.	ISSC (IBM subsidiary)		80	1993	5 years	27

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Table 3. *Continued*

User company	Outsourcing vendor	Type of activity outsourced	\$ Amount (millions)	Contract year	Initial contract duration	References (listed at foot of table)
Hibernia National Bank	IBM	Entire IS function		1989	9 years	20
Holiday Inns Inc.*	ICG & Inacom Inc.	International operations		1993		28
Hook SuperRx Urban Development	ISSC (IBM subsidiary)	Operations		1993		29
Housing and Urban Development	Martin Marietta	Data centre operations	526	1990	12 years	30
Imperial Oil Co. (Canada)*	Digital Eq. & EDS of Canada	Entire IS operation		1992		31
International Bank of Asia (Hong Kong)*	EDS	System management		1989	10 years	32
J.P. Morgan	B.T. North American	Communications	20	1992	5 years	33
J.P. Morgan*	MCI Comm. Corp.	Worldwide communications	80	1993	5 years	34
J.P. Morgan*	AT&T	Worldwide communications	8	1993	3 years	35
Kaiser Permanente	ISSC (IBM subsidiary)	Data centre operations for 5 expansion regions	70	1993	10 years	8
Kooperativa Forbunder (Sweden)*	EDS		1000	1993	10 years	36
McDonnell Douglas Corp.	ISSC (IBM subsidiary)	Entire data and voice operations	3000	1993	10 years	13, 37
Meritor Savings Bank	EDS		300	1989	10 years	20
Mexico Ministry of Finance**	Systemhouse & Canada Post	Data processing telecommunications systems management	550	1992	10 years	38
National Car Rental System Inc.	EDS	Data centre operations, reservation system	500	1991	10 years	39
Qualex, Inc.	ISSC (IBM subsidiary)			1993	10 years	13
Riser Foods	EDS	Entire IS function	32	1988	8 years	40, 41
Saab Scania AB*	EDS	Entire IS function	300	1990	10 years	42
Signet Banking Corp.	EDS	Entire IS function	300	1991	10 years	43, 44
Subaru of America, Inc.	Unisys Corp.	Network operations	45	1992	7 years	45, 46

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Table 3. Continued

User company	Outsourcing vendor	Type of activity outsourced	\$ Amount (millions)	Contract year	Initial contract duration	References (listed at foot of table)
Sun Refining and Marketing Co.	Andersen Consulting	Data processing, communications	200	1990	10 years	47
Trane Co. (ASI subsidiary)	McDonnell Douglas		25	1989	5 years	20
Twentieth Century Fox*	ICG	International operations		1993		28
United Technologies Automotive	Genix Group		14	1993	5 years	48
United Technologies Corp.	IBM	Newington (Conn.) data centre operations	2000–3000	1992	10 years	45, 49
WCI Steel	Computer Sciences Corp.	Entire IS function	64	1992	10 years	50
Westmoreland Coal Co.	EDS	Data centre operations and communications		1990	10 years	51

* International company; ** multinational deal.

References:

- ¹FISERV INC. (1990). *Annual Report 1990*, p. 6. ²KROSS, P. (1990). The dollars and sense of outsourcing. *Information Week*, 26 February. ³HALPER, M. (1993). Armco outsources to Genix. *Computerworld*, 26 April. ⁴ANON. (1993). Armco Steel outsources to ISSC. *Computerworld*, 8 February, p. 16. ⁵TYAN, A. (1989). Banksouth agrees to cede control of data center to IBM. *Computerworld*, 9 October. ⁶ANON. (1992). EDS to ink pact with Bethlehem Steel. *Computerworld*, 21 December, p. 2. ⁷FITZGERALD, M. (1992). System Odyssey leads to outsourcing. *Computerworld*, 17 February, pp. 73, 76. ⁸MARGOLIS, N. (1993). HMO outsources to ISSC. *Computerworld*, 18 January, p. 16. ⁹WILLETT, S. (1993). Vendors, users turning to outside help for technical support. *Infoworld*, 15 (No. 8), p. 12. ¹⁰COALE, K. (1992). British Petroleum outsources IS. *Infoworld*, 3 February, p. 47. ¹¹CUMMINGS, J. (1992). Bank off-loads datacenter, network upgrades to Unisys. *Network World*, 12 October, pp. 51, 59. ¹²VAN BRUSSEL, C. (1992). Canada Post executive defends outsourcing. *Computing Canada*, 21 December, pp. 1, 6. ¹³HALPER, M. (1993). Reinventing Big Blue. *Computerworld*, 18 January, p. 16. ¹⁴ANON. (1992). So who needs to be the President? Information Processing. *Business Week*, 10 August, pp. 65–66. ¹⁵FITZGERALD, M. AND WILDER, C. (1991). Giant firms join outsourcing parade. *Computerworld*, 30 September. ¹⁶LOH, L. AND VENKATRAMAN, N. (1992). Diffusion of information technology outsourcing: influence sources and the Kodak effect. *Information Systems Research*, 3 (No. 4), pp. 334–378. ¹⁷SCT ANNUAL REPORT (1992). ¹⁸NASH, KIM, S. (1992). Del Monte feeds EDS its IS operations. *Computerworld*, 9 November, p. 12. ¹⁹VERITY, J.W., COY, P. AND ROTHFEDER, J. (1990). Taming the wild network. *Business Week*, 8 October, pp. 143–148. ²⁰CALDWELL, B. (1989). Heinz cans data centers. *Information Week*, 7 August. ²¹MARGOLIS, N. (1993). ISSC, Equifax sign \$ 650M deal. *Computerworld*, 3 May. ²²ANON. (1992). Looking ahead and moving forward. *EDS Annual Report*. ²³ANON. (1991). Taking a second look at the concept of outsourcing. *Infoworld*, 13 May, pp. s8–s9. ²⁴MOOD, J. (1991). A kinder, gentler EDS? *Datamation*, 15 February. ²⁵SYSTEMS AND COMPUTER TECHNOLOGY, INC. *Annual Report 1991*, p. 3. ²⁶GILLIN, P. (1992). Outsourcers: get close but not too close. *Computerworld*, 21 December, p. 54. ²⁷ANON. (1993). New Shorts. *Computerworld*, 5 April, p. 16. ²⁸HOFFMAN, T. (1993). Bridging the IS continental divide. *Computerworld*, 8 March, p. 87. ²⁹BROWN, B. (1993). ISSC subsidiary glum picture for big blue. *Network World*, 25 January, p. 4. ³⁰ANTHES, G.H. (1990). HUD set to outsource IS. *Computerworld*, 3 December, pp. 1, 119. ³¹NATTALIA, L. (1992). Outsourcing wave hits the oil patch. *Computing Canada*, 8 June, pp. 1, 7. ³²TENNANT, D. (1991). Hong Kong IS outsourcing wave. *Computerworld*, 22 July, p. 80. ³³HORWITT, E. (1992). JP Morgan on outsourcing bandwagon. *Computerworld*, 17 February, p. 50. ³⁴HORWITT, E. (1993). Banker signs \$ 80 M contract with MCI. *Computerworld*, 10 May, p. 2. ³⁵PATCH, K. (1993). Freeing up sticky problems. *Network World*, 10 (No. 8), p. 35. ³⁶ANON. (1993). New Shorts. *Computerworld*, 26 April, p. 16. ³⁷HALPER,

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M. (1993). IBM/McDonnell Douglas deal questioned. *Computerworld*, 11 January, p. 109. ³⁸BUCHOK, J. (1993). Systemhouse, Canada Post sign mega outsourcing deal. *Computing Canada*, 19 (No. 9), pp. 1, 4. ³⁹MARGOLIS, N. AND WILDER, C. (1992). Early adopters give qualified approval, but urge IS to keep its hands on the reins. *Computerworld*, 4 May, pp. 1, 20. ⁴⁰ANON. (1991). Outsourcing saves riser. *Chain Store Age Executive*, May, pp. 157–158. ⁴¹RISER FOODS INC. ANNUAL REPORT (1989). p. 19. ⁴²ANON. (1991). The Datamation 100: Electronic Data Systems Corp. *Datamation*, 15 June. ⁴³RADDING, A. (1992). The wrong goodbye. *CIO*, September, pp. 34–43. ⁴⁴THOMAS, K. (1991). The outsourcing experience. *Bank Management*, September, pp. 29–32. ⁴⁵CUMMINGS, J. (1992). Subaru to outsource daily nets operations to Unisys. *Network World*, 20 January, pp. 25–26. ⁴⁶ANON. (1992). Unisys takes driver's seat at Subaru. *Computerworld*, 13 January. ⁴⁷BOOKER, E. (1990). Sun R&M opts for outsourcing. *Computerworld*, 6 August, p. 4. ⁴⁸ANON. (1993). News Shorts. *Computerworld*, 3 May, p. 16. ⁴⁹MARGOLIS, N. (1992). Outsourcing boom over? You ain't seen nothing yet. *Computerworld*, 13 January, p. 8. ⁵⁰WILDER, C. (1992). CSC clinches \$64 million deal with large steel company. *Computerworld*, 27 April, p. 6. ⁵¹ANON. (1990). EDS takes the wheel. *Computerworld*, 7 May, p. 66.

What to outsource?

There are many questions commonly asked by managers considering outsourcing, these include: What to outsource? Shall firms outsource complete IS function? Is it better to outsource only certain IS activities? Does this depend on the nature of business of the firm? The IS development effort and the role of incomplete contracts and outsourcing in that context has been analysed by Richmond *et al.*¹³ Incomplete contract framework is used as most outsourcing contracts are incomplete, since rapidly changing technology and organizational environment makes it impossible to specify every contingency in a contract. For example, the IBM–Kodak contract requires IBM to maintain a 'state-of-the-art' data centre during the course of the contract. It does not state in specific terms what operating system version, disk technology, etc. shall be used. The results of the model, under certain assumptions, indicate that value generated from outsourcing and development effort comes from the specific investments made by the vendor, and outsourcing dominates internal development when this investment is relatively more important than investments by the internal user group. This provides one economic explanation for the coexistence of both internal development teams and of various outsourcing services. Does it mean that it is better to outsource routine application systems' development, while retaining the more involved, business-related applications in-house?

Various other articles make general comments about retaining the IS functions which are 'strategic', while outsourcing the operational systems.

What are the contractual issues?

At the heart of outsourcing is the contract which guides the activities of the parties involved and is the source for any conflict resolution. A game-theoretic model to incorporate incentive and information issues associated with contracting for software development is developed by Whang.¹⁴ Under certain assumptions, the model constructs a viable contract that aligns the incentives of the contracting parties and produces the same equilibrium as for in-house development. The paper states that the derived contract is mathematically neat, but has limited applicability because of difficulty in obtaining, or agreeing on, the input parameters.

Contractual issues pertaining to the various stages of the systems development life cycle (SDLC) are identified and examined by Richmond and Seidman.¹⁵ Using Williamson's Transaction Cost framework,

¹³*Op. cit.*, Ref. 4.

¹⁴WHANG, S. (1992). Contracting for software development. *Management Science*, 38 (No. 2).

¹⁵RICHMOND, W.B. AND SEIDMAN, A. (1991). Outsourcing and contracting issues in the systems development life cycle. Working paper, William E. Simon Graduate School of Business Administration, University of Rochester, NY.

Table 4. Vendor contract issues

	Vendor contract issues
Experience	Prior success in outsourcing Knowledge of client's industry
Planning	Evidence of long range planning International perspective
Technology/Personnel	State-of-the-art technology Trained personnel in appropriate areas Plans for technology improvements
Contract issues	Flexibility in entering/exiting contract Willingness to negotiate
Communication	Working relationship between vendor and client Importance of client's input/communication
Transfer of personnel	
Financial stability	

authors have shown that for new customized software development, with the possible exception of the procedure development phase, all other phases are amenable to outsourcing. Mapping of other phases to different governance structures (market, trilateral and bilateral) is proposed. Ketler and Walstrom¹⁶ present some pertinent issues in vendor contracts which are grouped as experience, planning, technology/personnel, contract issues, communication, transfer of personnel and financial stability (Table 4).

Such analytical work needs to be followed up by empirical research to show the validity of the results and the assumptions in real situations. Empirical evidence for the outsourcing phenomenon is needed, especially: is it really happening across the spectrum of industries? Is it part of a larger phenomenon whereby the very nature of the firm is changing?

The potential of IS outsourcing resulting in the adoption of a new organizational form is explored by McLellan.¹⁷ This new organizational form, known as the 'dynamic network', may come as a result of large-scale vertical disaggregation, internal and external brokering, full-disclosure information systems and market substitutes for administrative mechanisms.¹⁸

The above is not an exhaustive list of issues related to IS outsourcing. Many other issues, such as implications for IS professionals,¹⁹ end-user computing support etc., are being explored too.

Content analysis of references to outsourcing in annual reports

Clients' annual reports

Content analysis²⁰ for information systems research has been successfully used by Jarvenpaa and Ives²¹ and Neo.²² The first addresses the relationship between information technology (IT) and corporate strategy. The second deals with IT and the firm's competitive advantage. Here, we will use content analysis to identify the value of the outsourcing activity for the 62 companies listed in Table 3. For this

¹⁶Op. cit., Ref. 2.

¹⁷MCLELLAN, K. (1991). MIS outsourcing, organizational networks and competitive advantage. Working paper, School of Business Administration, The University of Western Ontario, London, Canada.

¹⁸MILES, R. AND SNOW, C. (1986). Organizations: new concepts for new forms. *California Management Review*, 3, pp. 62-73.

¹⁹LEINFUSS, E. (1991). How outsourcing impacts IS managers. *Computerworld*, 16 September; LEINFUSS, E. (1991). IS staff can win when outsourcers are employers. *Computerworld*, 23 September.

²⁰KERLINGER, F.G. (1986). *Foundations of behavioural research*, 3rd edition, chapter 30. Holt Rinehart and Winston.

²¹JARVENPAA, S.L. AND IVES, B. (1990). Information technology and corporate strategy: a view from the top. *Information Systems Research*, 1 (No. 4), pp. 351-376.

²²NEO, B.S. (1988). Factors facilitating the use of information technology for competitive advantage. *Information and Management*, 15, pp. 191-201.

purpose the annual reports, where the companies explain outsourcing activities, are examined. Table 5 shows whether a company's annual report refers to the outsourcing activity in the year of the major outsourcing contract. For the 16 companies who signed an outsourcing contract in 1993, their annual reports are not yet available. From the rest, we collected annual reports for 25 companies. Of these, nine did not refer to the outsourcing activity to the shareholders. The other 16 mention outsourcing issues in their annual reports. Hook SuperX outsourced in 1993 but they mentioned the benefits in their 1992 annual report. It appears that high technology and information intensive companies tend to announce outsourcing activities in their annual report. Twelve of the companies are international companies and only Saab Scania AB's annual report is available.

The reasons why companies opt for outsourcing as mentioned in the annual reports are given in Tables 6 and 7. The most cited reason is *cost reduction*. Eleven of the 17 companies believe that specialized IS companies can do IS activities cheaper. In addition, one company also mentioned transforming fixed costs into variable costs as the reason for outsourcing.

The second most mentioned reason is the desire to be at the *forefront of technology*. Outsourcing activity is believed to bring the recent technological advances to company's fingertips. Nine companies think along these lines. One additional company believes that they can get unlimited capacity which could be translated as the forefront of technology. Another company talks about technological integration which can be looked under the same umbrella.

Seven companies point out that outsourcing brings efficiency. Four of them also mention cost reduction. It is interesting that they talk about efficiency which shows that they expect outsourcing to reduce the cost as well as increase the value.

Other mentioned characteristics are flexibility, strategic alliance and better focus on company's core business. Long-term contract, access to companies' secret information and dependence on each other build a deeper relationship between the company and the vendor. One's success affects the other's. One's performance depends on the other's. The price the vendor charges is a function of the satisfaction level of the existing customers over a period of time. The strategic alliance is achieved by letting the company do its own business and allowing the vendor to perform information services. This is accomplished through a calculated risk in mutual trust and respect.

It is interesting that flexibility is mentioned as a plus in some annual reports. However, the outsourcing literature contends outsourcing reduces flexibility, because long-term outsourcing contract binds a company in a partnership with the vendor that is difficult to break, thus limiting flexibility. On the other hand one can easily change the computational capacity or a selection of software, which translates into increased flexibility. We will close this discussion by saying flexibility is a function of the contract, an honour system between the vendor and the company and the damage that the company can do to the vendor's reputation. Deeper research is needed to determine the true effect of outsourcing on flexibility.

Vendors' annual reports

An analysis of the annual reports of the outsourcing vendors indicates

Table 5. Major outsourcing contracts — annual reports collection status

User company	Contract year	Annual report found	Comments
American Savings of Stockton (CA)	1990	no	
American Standard Inc.	1989	yes	No reference to OS* contract
Armco Advanced Materials Co.	1993	NA	Not yet available
Armco Steel	1993	NA	Not yet available
Bank South	1989	yes	✓
Bethlehem Steel	1992	yes	✓
Blue Cross/Blue Shield of Mass.	1992	NA	Not yet available
Blue Cross/Blue Shield of New Jersey	1992	NA	Not yet available
Borland Int. Inc.	1993	NA	Not yet available
British Petroleum	1992	yes	No reference to OS contract
California Republic Bank	1992	NA	
Canada Post	91/92	no	
Chase Manhattan Bank NA	1993	NA	Not yet available
Continental Airlines	1990	yes	✓
Continental Bank Corp.	1991	yes	✓
Cullen/Forest Bankers	1989	yes	✓
Dallas County	1992	no	Not a corporation
Del Monte Foods	1992	NA	Not yet available
Dial Corp.	1989	yes	No reference to OS contract
(Greyhound subsidiary)			
Duracell	1990	yes	No reference to OS contract
Eastman Kodak	1989	yes	✓
Enron	1988	yes	✓
Equifax Inc.	1993	NA	Not yet available
Europcar	1992	NA	Not yet available
FAA	1992	no	Not a corporation
First American Bankshares, Inc.	1991	no	
First City Bancorp of Texas	1988	yes	✓
First Fidelity Bankcorp	1990	yes	✓
First Tennessee National Bank	1989	yes	✓
Freeport-McMoRan	1988	yes	No reference to OS contract
General Dynamics	1991	yes	✓
The George Washington University, DC	1991	no	
H.J. Heinz Co.	1989	yes	No reference to OS contract
Harvest Foods Inc. (Little Rock, AR)	1992	NA	Not yet available
Hertz Co.	1993	NA	
Hibernia National Bank	1989	yes	✓
Holiday Inns Inc.	1993	NA	Not yet available
Hook SuperRx	1993	NA	OS mentioned in 1992 AR
Housing and Urban Development	1990	no	Federal agency
Imperial Oil Co.	1992	no	
Inter. Bank of Asia	1989	no	
J.P. Morgan	1992	no	
J.P. Morgan	1993	NA	Not yet available
Kaiser Permanente	1993	NA	Not yet available
Kooperativa Forbunder (Sweden)	1993	NA	Not yet available
McDonnell Douglas Corp.	1993	yes	✓
Meritor Savings Bank	1989	no	
Mexico Min. of Finance	1993	no	Not a corporation
National Car Rental System Inc.	1991	no	Private company, no AR
Qualex Inc.	1993	NA	Not yet available
Riser Foods	1988	yes	✓

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Table 5. *Continued*

User company	Contract year	Annual report found	Comments
Saab Scania AB	1990	yes	✓
Signet Bank Corp.	1991	yes	✓
Subaru of America, Inc.	1992	NA	Not yet available
Sun Refining and Marketing Co.	1990	yes	No reference to OS contract
Trane Co. (ASI subsidiary)	1989	yes	No reference to OS contract
Twentieth Century Fox	1993	NA	Not yet available
United Technologies Automotive	1993	NA	Not yet available
United Technologies Corp.	1992	NA	Not yet available
WCI Steel	1992	NA	Not yet available
Westmoreland Coal Co.	1990	yes	No reference to OS contract

* OS: outsourcing.

Table 6. *Valuation of outsourcing contracts*

User company	Characteristics								
	1	2	3	4	5	6	7	8	9
Bank South	✓				✓				
Bethlehem Steel	✓	✓					✓		
Continental Airlines	✓	✓							
Continental Bank Corp.	✓	✓	✓		✓				
Cullen/Frost Bankers	✓	✓							
Eastman Kodak							✓		
Enron	✓								
First City Bancorp of Texas	✓	✓			✓				
First Fidelity Bankcorp					✓			✓	
First Tennessee Coop.	✓	✓			✓		✓		
General Dynamics	✓						✓		✓
Hibernia National Bank	✓	✓		✓		✓			
Hook SuperRx Inc.		✓			✓		✓		
McDonnell Douglas							✓		
Riser Foods Inc.					✓				
Saab Scania AB			✓						
Signet Banking Corp.	✓	✓		✓					

Table 7. *Criteria for valuation of outsourcing contracts*

Number	Characteristics
1	Cost reduction
2	Forefront of technology
3	Strategic alliances
4	Flexibility
5	Efficiency
6	Unlimited capacity
7	Better focus on company's core business
8	Technological integration
9	Transforming fixed cost to variable cost

Table 8. Major outsourcing vendors' annual reports

Outsourcing vendor	Year	Comments: Outsourcing contracts referenced
IBM	1989	Kodak, Hibernia National Bank
	1990	No reference to major OS contracts
	1991	No reference to major OS contracts
EDS	1988	Enron, Freeport McMoRan, Riser food, First City Bancorp.
	1989	Meritor Savings Bank
	1990	Saab, First Fidelity Bankcorp, Westmoreland Coal Co.
	1991	National Car Rental
	1992	Bethlehem Steel, Blue Cross Blue Shield of Mass.
CSC	1991	US Borax and Chemical, Memorex Telex
FiServ	1989	General Dynamics
	1990	No reference to OS contracts
Systematics Inc.	1991	American Savings of Stockton (CA), First Bank Milwaukee
	1989	Resolution Trust Corporation
	1992	Gainer Bank Co., Integra Financial Co., The Boston Five Center Savings Bank, Great American Bank
Systems and Computers Technology	1991	The George Washington University
	1992	Dallas County

Table 9. Valuation of outsourcing contracts from the vendor's point of view

Vendor company	Characteristics			
	1	2	3	4
IBM (1989)	✓	✓	✓	
EDS (1988)				✓
EDS (1990)	✓	✓	✓	
EDS (1992)		✓	✓	
CSC (1992)	✓	✓	✓	
FiServ (1990)	✓			
FiServ (1991)	✓	✓		✓
Systematics (1989)	✓	✓		
SCT (1989)	✓		✓	
SCT (1991)	✓			
SCT (1992)	✓		✓	

that most of them either do not mention the outsourcing contract or discontinue mentioning it after the first year of the contract. Among the six companies that do mention outsourcing in the annual reports, they agree on the effects of outsourcing. Companies (Tables 8 and 9) believe that outsourcing reduces the cost for the outsourcing company, brings better services and technology and allows the company to focus on their core business activity. In its first annual report since the outsourcing contract, EDS mentioned outsourcing as effective, which in the later year was quantified as the three characteristics mentioned above.

Discussion

Businesses who opted for outsourcing, believe that specialized IS companies can bring 'state-of-the-art' IS services at a cheaper cost than they can have in house (Table 10). For example, in its contract with IBM, Kodak requires IBM to provide 'state-of-the-art' equipment at all times. In an interview, Katherine Hudson, Kodak's Vice-President and General Manager of the Imaging Group, who was responsible for the outsourcing move, emphasized that the key to the outsourcing success was the 'chemistry' between IBM and Kodak, and their mutual belief in the honour system. Kodak is proud of this achievement and is currently having people visit their 'state-of-the-art' data centre which is a form of

Table 10. Criteria for valuation of outsourcing contracts

Number	Characteristics
1	Cost reduction for the client
2	Better IS service and IT for the client
3	Focus on core activity for the client
4	Increase effectiveness for the client

voluntary advertisement for outsourcing and IBM. It should be noted, however, that this tie is enforced by the implicit penalty function, which may involve informing the stock market if IBM defaults. This would cost IBM dearly in terms of the current market value and future lost customers. The honour system enforced by the implicit penalty function leaves little room for post opportunistic behaviour by IBM. The prohibitive change over cost for Kodak, forces both the parties to guarantee the success of the partnership.

Another interesting question is whether outsourcing is an international phenomenon. We could only obtain information on 12 international companies, one multinational deal and only one annual report was accessible. Most of the international outsourcing occurred in 1993. The number of outsourcing deals are becoming widespread internationally. However, there are not enough annual reports to conclude whether international organizations value outsourcing the same way most US organizations do. Hence it is an open research issue whether the US findings can be generalized to the international context.

Outsourcing can be used as a strategic weapon for staying even or gaining competitive advantage.²³ It might not be right for every situation. US managers might be giving up more than they anticipated. This requires the US managers to be more careful with the outsourcing decision. They need to look at the international arena and better ways of costing information. The quality of information the managers are using to make decisions are associated with risk.²⁴ In addition to regulatory and technological risks, there are especially significant risks associated with using old accounting systems to make international decisions. The following are some examples of international deals.

Infonet Services Corp., AT&T and BT/Syncordia take over the task of designing and provisioning a backbone network across multiple countries, each with its regulations, price structures, language and network interface standard.²⁵ Holiday Inns Inc. maintain IS operations in Brussels and Hong Kong as well as the company's 200 international hotels. International Computer Group (ICG) formed an alliance with Inacom Inc. (the Omaha-based company) to provide services for Holiday Inns Inc.²⁶ Twentieth Century Fox Film Corp. uses ICG for services in France, the UK, Holland, Italy, Spain and Germany. J.P. Morgan had an agreement with MCI Communications Corp. to have a communications service among 20 international sites.²⁷ J.P. Morgan also had a deal with AT&T for wide-area network services throughout Europe, North America, Asia and Australia.²⁸ Eunetcom, put together by France Telecom and Deutsche Bundespost Telekom, starts a competition between itself, AT&T and British Telecom. Mexico's Ministry of Finance had a deal with SHL Systemhouse Inc. and Canada Post for data processing, telecommunication and system management worth \$550 million in 1992.²⁹ At present, the international outsourcing covers international telecommunications.

The above discussion leads into the more fundamental and philosophical question, whether outsourcing is specific to IS functions or is it as widespread as publicized. Although it is very hard to collect data and show trends, we would point readers to the one-person company portrayed in Harvard Business School case R&R (9-386-019). In this case Bob Reis outsources all functions which includes design, marketing, sales and others and exists as a one-person company. This research can be extended to enlarge the scope and consider whether the basic

²³DAVIES, E.W. (1992). Global outsourcing: have US managers thrown the baby out with the bath water. *Business Horizon*, 35 (No. 4), pp. 58-65.

²⁴HOWELL, R.A. AND SOUCY, S.R. (1991). Determining the real cost of doing business in a global market. *National Productivity Review*, 10 (No. 2), pp. 157-165.

²⁵HORWITT, E. (1993). Global net solution still elusive. *Computerworld*, 29 March, p. 71.

²⁶HOFFMAN, T. (1993). Bridging the IS continental divide. *Computerworld*, 8 March, p. 87.

²⁷HORWITT, E. (1993). Banker signs \$ 80 M contract with MCI. *Computerworld*, 10 May, p. 2.

²⁸PATCH, K. (1993). Freeing up sticky problems. *Network World*, 10 (No. 8), p. 35.

²⁹BUCHOK, J. (1993). Systemhouse, Canada Post sign mega outsourcing deal. *Computing Canada*, 19 (No. 9). pp. 1, 4.

organizational form is evolving towards a 'virtual' organization (concept similar to the 'strategic network' of Miles and Snow³⁰ or 'hollowed out' corporation); or perhaps we can hypothesize that, with vanishing barriers of time and space, society is moving almost completely towards 'electronic markets'.

The relationship between performance and outsourcing

Another interesting question is whether there is any relationship between IS outsourcing and the firm's performance. One can study the research on impact of information technology (IT) on the firm's performance to analyse the effect of outsourcing on the firm's performance. In a recent study,³¹ the authors found that IT investment variables became significant predictors of performance when they are grouped together and analysed. One of the performance variables used by Mahmood and Gary³² is sales per employee. It is proved to be significantly related to IT investment variables.

Most studies caution against the use of a single measure of performance. Many confounding variables exist and in order to glean the effect of IT or any other phenomenon on performance, there is a need for a conceptual model. Also, there is a need for longitudinal and cross-sectional data. For example, in the banking industry one may need to collect data on organizational performance with and without outsourcing, nature of outsourcing contracts, and other organizational variables. Smith and McKeen³³ suggest that business revenue per capita is a good measure for the firm's performance.

There is a general agreement among managers that the effectiveness of outsourcing contracts can be measured by the value added benefit to each employee. However, the main problem of this measure is that no one has either defined or collected data on this important yardstick. This leaves us with no choice but to use the sales per employee measure. Tables 11 and 12 show apparent values for non-banking and banking companies who are involved with outsourcing. For the non-banking companies the value is given in terms of sales per employee. In most cases, sales per employee figures increased in the year outsourcing was announced. However, there are cases where sales per employee decreased after and in the year of outsourcing. In five cases, sales per employee jumped during the year of outsourcing. There are two cases where this productivity measure decreased in the year of outsourcing.

For the banking companies, deposit market share is used as the dependent variable in Banker and Kaufmann's study. Some other studies considered total assets per employee as a criterion. In Table 12, revenue per employee is used as a variable to measure the effect of outsourcing. As is evident from Table 12 this variable does not show a general pattern. It is very difficult to reach a conclusion without a conceptual model.

Conclusion

The potential risks and benefits of outsourcing have been explored and the advantages and disadvantages analysed in personnel, economic, control, data/segment and organizational dimensions. It has been

³⁰*Op. cit.*, Ref. 18.

³¹MAHMOOD, M.A. AND GARY, J.M. (1991). Measuring the impact of information technology on organizational strategic performance: a keys ratios approach. *Proceedings of Hawaii International Conference on Systems and Software*, pp. 251–258.

³²*Ibid.*

³³SMITH, H.A. AND MCKEEN, J.D. (1991). How does information technology affect business value? A reassessment and research propositions. *Proceedings of Hawaii International Conference on Systems and Software*, pp. 429–437.

³⁴BANKER, R.D. AND KAUFMANN, R.J. (1988). Strategic contributions of IT: an empirical study of ATM. *Proceedings of Ninth International Conference on Information Systems*.

Table 11. Productivity data for major outsourcers — non-banking companies

Outsourcing company	1988			1989			1990			1991			1992		
	Sales \$M	Employees	Sales per employee	Sales \$M	Employees	Sales per employee	Sales \$M	Employees	Sales per employee	Sales \$M	Employees	Sales per employee	\$M	Employees	Sales per employee
Eastman Kodak*	17034	145300	117.23	18398	137750	133.56	19075	134450	141.87	19649	133200	147.52	20577	132600	155.18
Freepoint-McMoran*	1944	6474	300.28	2015	7310	275.65	1618	7344	220.32	1603	7280	220.19	1656	7957	208.12
Heinz*	5244	39000	134.46	5832	36200	161.10	6112	37300	163.86	6682	34100	195.95	6628	35500	186.70
Sun Refining*	8612	21300	404.32	9927	21600	459.58	11909	20900	569.81	10246	17000	602.71	8626	14216	606.78
Westmoreland Coal*	593	1585	374.13	605	1295	467.18	556	1242	447.67	570	1226	464.93	@	@	@
Continental Airlines*	8572	67937	126.18	6768	53055	127.57	6283	41300	152.13	5551	36300	152.92	5575	38300	145.56
Enron*	5707	6263	911.22	9869	6296	1567.50	13201	6962	1896.15	13522	7371	1834.49	14126	7776	1816.62

@: Company not in Fortune 500 or Fortune Service 500 for the year. *: Data source is the yearly Fortune 500 survey. #: Data source is the yearly Fortune Service 500 survey. Figures in bold: Data for the year in which outsourcing contract was signed.

Table 12. Productivity data for major outsourcers — banking companies

Outsourcing company	1988			1989			1990			1991			1992		
	Deposits and loans \$M	Employees	(Deposits + loans) per employee	Deposits and loans \$M	Employees	(Deposits + loans) per employee	Deposits and loans \$M	Employees	(Deposits + loans) per employee	Deposits and loans \$M	Employees	(Deposits + loans) per employee	Deposits and loans \$M	Employees	(Deposits + loans) per employee
BankSouth*	3522	3080	2190	3723	3010	2325	4027	3156	2280	@	@	2286	3632	2492	2494
First City Bancorp of Texas	3223	9842	6681	3276	10818	2737	3168	6461	2772	8797	6143	2286	2583	@	@
First Fidelity Bankcorp*	21562	14100	2889	22872	13500	3148	7640	23080	3910	25218	11504	3646	27004	10600	4224
Hibernia National Bank*	19173	4729	3453	19631	5869	3483	17974	3771	3050	16731	3238	2729	17767	2394	2594
Meritor Savings Bank*	4175	4218	6318	4679	2973	7061	5013	1634	6108	5301	1363	6573	4036	@	@
	12209			10503			4819			3535			2175		
	14442			10489			5162			4403					

@: Company not in Fortune 500 or Fortune Service 500 for the year. *: Data source is the yearly Fortune 500 survey. #: Data source is the yearly Fortune Service 500 survey. Figures in bold: Data for the year in which outsourcing contract was signed.

forecast that IS outsourcing expenditures will be between \$15 to \$50 billion in 1995 and there are examples in the retail industry and commercial banking industry to support the claims. Table 3 lists the major outsourcing contracts. One study shows statistically significant excess returns in stock prices on the announcement days for the companies that decided to outsource. Other studies indicate what to outsource, how to outsource and under what conditions to outsource.

The content analysis of annual reports has been explained to find the value of outsourcing contracts. The number one reason is cost reduction. The number two reason given is to be at the forefront of technology. It is important to note that two of the conceptual advantages to outsourcing, strategic alliance and better focus on company's core business, are sure to become more important as outsourcing becomes more common. The relationship between performance such as revenue per employee and sales per employee and outsourcing has been shown, however, the number of data points are too few to reach a solid conclusion.

Some outsourcing contracts are not disclosed to the press. It is very difficult to estimate the exact amount spent on IS outsourcing. Concrete proof is needed that companies are really spending more money on IS outsourcing. This is very difficult, since some studies show the amount spent in 1990 as \$30 billion while others declare it to be \$7 billion.

One extension of this research is to study the concrete proof of IS outsourcing expenditures. One option is to do a time series analysis of outsourcing expenditures. The other option is to analyse the revenues of outsourcing vendors. Both of these options are difficult, since the data is hard to collect. Also, vendors like IBM have other facets of their business, therefore, it is very difficult to divide the total revenue by certain functions.

Other interesting research questions include: Where are we heading? Is this growing trend unique to IS or does it involve other functional areas as well or is it a US or global phenomenon? Are we reliving 'the hollowed out corporation?' In other words, 'are companies becoming virtual?'