Improving business and information strategy alignment: Learning from the banking industry

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An empirical study that explored business and information strategy alignment in the information-intensive and competitive Australian banking industry is featured in this paper. The aim of the study was to identify organizational practices that contribute to and enhance such alignment. Multiple sources of information were used to collect data about business and information strategies from the major firms dominating Australian banking. Sources included written and interview-based information, strategic planning documentation, and annual reports. Evidence was sought for the alignment of business and information strategies through the use of information and information technology that provided a comparative advantage to an organization over its competitors. The firm-wide strategy-formation processes of the banks, rather than their information systems (I/S) methodology, was central to the alignment of business and information strategies. The interdependence of firm-wide processes and I/S factors are emphasized in a strategic alignment model that summarizes the findings of the study. The paper concludes with a discussion of the management implications and requirements for action in both firm-wide strategy and I/S areas. The results of this study in the banking industry are pertinent to other industries where information technology and systems are playing an increasingly strategic role.

Following are statements made by executive managers of large banks, speaking about the challenges in their internal and external environments:

"We are trying to address the information environment . . . At present, all of our systems are . . . product driven, rather than customer driven"—information systems and technology (IS/T) manager.

"We have no [information-based] advantages over our competitors. The large banks are mostly all plodding along"—strategic planning manager.

"Our list of 'things to do' . . . to obtain necessary customer information . . . is greater than our capacity to do them"—strategic planning manager.

Underpinning their concerns is the need for better alignment of their business and information strategies, where business objectives are enabled, supported, and stimulated by information strategies.

Aligning business and information strategies is a major and continuing challenge for information systems and technology (IS/T) managers. The

alignment of I/S and corporate goals has consistently been among the top issues in both North American and U.K.-based studies.[1-4] In three recent Australasian studies, IS/T managers ranked the alignment of information systems with business goals as their highest concern.[5,6]

This paper reports on part of an empirical study that explored the nature of business and information strategy alignment in the major firms dominating the Australian banking industry. The aim of the study was to identify organizational policies and practices that contribute to alignment.

The paper commences with an explanation of the Australian banking industry and the research approach and data collection sources of the study. Next is a discussion of the type and nature of advantages each firm has relative to its competitors.

Different organizational practices among these firms provide grounded evidence for 15 propositions about alignment. These propositions are grouped into an alignment model that emphasizes the interdependence of firm-wide and IS/T factors. The paper concludes with a discussion of the management implications and requirements for action in both firm-wide and IS/T areas.

The Australian banking industry

Banks operate in a strategic I/S environment, where the alignment of business and information strategies should be a significant focus for organizational effort. Financial institutions are critically dependent on I/S activity for daily operations.[7] Banks are information-intensive and highly dependent on information technology as their core technology.[8,9] This dependence is even greater for major banks operating in a very competitive environment, such as that in Australia.

Banks were among the first groups to implement interorganizational information systems at both national and international levels. The banking sector is at the forefront of business-oriented technology developments[10,11] though sometimes these have shown disappointing returns to the firms.[12]

Banks operating nationally in Australia provide retail and wholesale services to a population of 17 million people dispersed over an area as large as the continental United States. The banking sector includes some of Australia's largest firms, with the number of employees in each of the five major banks ranging from over 10 000 to over 40 000 (1988 figures).

The five banks targeted in this study accounted for 82 percent of the total assets of banks operating in Australia.[13] They are direct competitors in most market segments. Each has a national retail branch network, and three have significant international operations. All five banks were in the top 20 of Australia's "Top 500 Computer Users" in 1990, and four of the five were in the top 10.[14]

The past decade has been one of rapid change in the banking and finance sector as the industry has moved from a relatively high level to a low level of regulation. Since 1983, the Australian federal government relaxed trading-bank deposit-taking restrictions, significantly deregulated the foreign exchange market, and approved the entry of foreign banks into the Australian market. In the words of one of the retail banking executive managers who was interviewed, "the superimposition of the technological revolution, along with deregulation, [made] for exciting times."

Research approach

The case-study research design involved multiple sources of data collected in a structured manner. Case-study research design was used because of the lack of a cumulative theoretical base, the need to examine complex phenomena in depth, terminological variations, and the sensitive nature of the data that had to be collected.[15,16]

Cross-industry studies have consistently shown that the financial services area is relatively mature in its information strategy development processes.[5,17-19] Banks are more likely than firms in most other sectors to have information systems strategy and implementation processes linked to the business aims of the firm.[17] I/S executives in the banking industry exhibit a higher level of participation in the strategic planning process of their organizations.[19] These factors contribute to greater coordination between business and information systems strategy.[19]

Limiting the study to one leading-edge industry avoided the problem of cross-sectional studies by

minimizing the effect of moderating variables[20] and facilitating the analysis of multiple sources of evidence. The banks were "critical sites,"[15] where evidence for business and information alignment was expected to be most acute.

In this study, alignment of business and information strategies referred to the extent to which business strategies were enabled, supported, and stimulated by information strategies. Evidence for alignment was sought in the use of information or information technology, or both, which provided a comparative advantage to an organization over its competitors. Examples of such uses were referred to as information-based comparative advantages (IBCAs). Banks with more extensive and strategy-enabling IBCAs were seen to have a higher level of business and information strategy alignment than those with fewer strategy-enabling IBCAs.

The conceptual basis for this approach is the realized strategy framework of Mintzberg.[21–23] The notion of realized strategy is very pertinent to the information systems area where developments in the information industry might make it inappropriate to pursue some intended strategies while others emerge. (See References 24 and 25 for further elaboration.) Realized, or actual strategy, is that part of the planned or intended strategy which is achieved together with emergent strategy developed in response to unanticipated situations.

The aim of this hypothesis-generating study was to identify what organizational practices contribute to the alignment of business and information strategies. The key research question addressed was: Is there evidence to support the development of propositions about the relationship between the nature and extent of a firm's information-based comparative advantage and the firm's:

1. Firm-wide strategy-formation processes
2. Organizational structure and accountabilities
3. Information systems responsibilities and policies
4. Technology strategy

The first area above, firm-wide strategy-formation processes, refers to the way in which strategy is developed on a firm-wide level: the nature and extent of participation and documentation, the time frame for the planning, the firm's experience in strategic planning, and the extent of executive manager review of I/S strategy.

Organizational structure and accountabilities include the reporting and responsibility arrangements across the firm. The third area, I/S responsibilities and policies, focuses on these arrangements specifically as related to the I/S area. Technology strategy is the technical framework of the firm for decisions about computing and communications technology.

This study required data points that provided an informed perspective in each of these areas for each of the firms. The nature of the data sought was very sensitive, and input was required from a cluster of top managers in the banks. The level and nature of cooperation in four of the five major banks was high. One firm was not willing to participate fully in the study because of concerns about business confidentiality. Thus this paper reports on results from four banks.

Data sources

Major data collection sources for the four banks are summarized in Table 1. This combination of sources permitted triangulation of the data to strengthen the findings.[26–28]

Sources of data in each of the four banks included:

- Senior manager data: Written response form followed by focused interview session from four or five of the most senior managers in each firm who were responsible for strategic planning, information systems and technology (IS/T), retail banking, and wholesale or commercial banking or both. Most reported directly to the chief executive officer (CEO) of the firm and were members of the executive committee (or similarly named group) of the firm. These participants constituted a very significant group of "key actors" in the development and implementation of strategy in each of the firms. Interviews were recorded and later transcribed for analysis.
- Board-level strategic planning documentation: Access to extensive confidential board-level documentation concerning strategic planning processes and outcomes at both corporate and business unit levels.
- Other organizational documentation: Material related to organizational structures and responsibilities; external reports and reviews; documentation, plans, and presentations on I/S strategy.

Table 1 Data collection sources

Data	Bank 1	Bank 2	Bank 3	Bank 4
Number of executive managers: Response form and interview sessions	4	4	5	5
Board-level, strategic planning documentation	Corporate plan, 1 vol. (Note: No other corporate or business unit documentation prepared)	Corporate plan, 1 vol. Business unit plans, all 40+ vol.s Administration manual for preparing plans, 46 pages	Corporate plan, 1 vol. Business unit plans, 5 vol.s as examples Briefing document re strategy-formation process, 6 pages	IS/T strategy, 1 vol., incorporating board-level plans
Other organizational documentation	Organization charts, including structure and function responsibilities Internal reports and reviews	Documents, plans, presentations on IS/T strategy Organization charts including detailed structure and function responsibilities Internal reports	Documents, plans, presentations on IS/T strategy Organization charts including detailed structure and function responsibilities Internal reports	Documents, plans, presentations on IS/T strategy Organization charts including detailed structure and function responsibilities Internal reports
Annual report analysis	Annual reports, 1985–1989	Annual reports, 1985–1989	Annual reports, 1985–1989	Annual reports, 1985–1989

Note: Generic terms for documentation are used above, as specific titles could identify the banks and/or their strategic thrusts.

- Annual report analysis (1985–1989): A content analysis of five years of annual reports, identifying references to information systems and technology and the discussion of strategy (adapted from Jarvenpaa and Ives[9]).

The response form provided initial information from each manager on his or her perceptions of the strategic thrust(s) of the manager's firm, the nature, strengths, and weaknesses of the strategic planning processes of the firm, and the information-based comparative advantage of the firm. Areas pursued in the interview sessions and documents included aspects of organizational structure, accountabilities and responsibilities, and further details on the information-based advantages of the firm; in particular, the nature of the advantage achieved and the process of initiation, justification, design, implementation, and benefits tracking for the IBCA were examined.

The advantages gained were not confined to those that could be classed as yielding above-average profits in the industry.[8,29] These advantages could, for example, be positioning advantages, which were perceived to place the firm in a position where it would gain future benefits from the development or deployment of information technology (I/T). Recent annual reports of the banks indicated a number of areas in which each bank claimed to have gained some comparative advantages by using technology.

Because of confidentiality requirements, the banks are referred to as Bank One, Two, Three, and Four in reporting the results. Specific factual data concerning size, number of employees, systems in place, and financial assets cannot be given as any of these data would readily identify the firms. Generic terms are used for all executive manager positions. For similar reasons, only general comments can be reported on some sensitive organizational issues, particularly those related to the strategic orientation of the firms and details of the technology platforms. Within these constraints, some explanation follows concerning the organizational arrangements for information systems in each bank.

The organizational environment of the banks

The banks studied had either recently undergone, or were still undergoing, major organizational structural changes in the years when executive manager data collection took place (1988 to 1990).

All four firms had some form of divisionalized structure in place, though the level and nature of centralized I/S management and control varied.

Bank One had developed as a retail bank, adding corporate and treasury functions in the mid-1980s. The bank was divided into a small number of business units with two corporate support units, one of which included the major I/S group. Bank One was an example of centralized I/S arrangements with a centralized transaction processing system. Major I/S developments were undertaken as a result of executive committee decisions. The level and nature of I/S support differed in each of the business units, with retail banking being the major focus of centralized I/S activities.

Bank Two had a heavily divisionalized structure, both organizationally and for I/S. In the mid-to-later 1980s, business units had considerable autonomy in selecting hardware and in the development of software and products. As a result, Bank Two had a number of hardware and software platforms and limited availability of data across business units. Responsibility had been dispersed to the business units, which was consistent with the organizational and management approach of the bank. However, at the time of data collection, major efforts were being made to redress what was seen as overzealous devolution of responsibility for hardware, software, and data administration. This process involved identification, agreement, and documentation of appropriate I/T architectures across the firm.

Bank Three had a divisionalized structure but with I/S arrangements that were different from Banks One and Two. Throughout the 1980s, decisions related to architecture and major projects were made at the corporate level. These decisions were generally operationalized on a project basis under the control of business units. Data processing and communications operations were centralized at the corporate level. The I/S arrangements of Bank Three could best be described as a federated arrangement,[30] in which there was a corporate I/S group responsible for I/T infrastructure decisions and the centralized transaction processing system, with applications development being part of business unit responsibility.

Bank Four was also divided into business units, though these had much less autonomy than those in Banks Two and Three. The management and physical control of I/S was highly centralized, with a centralized transaction processing system. During the period of our study, changes were being made to provide greater business input and control in the I/S planning, approval, and support processes, while retaining centralized data processing operations. The strategy of the bank tended to be technology-led.

Of the four banks, three had centralized transaction processing systems, whereas the fourth had devolved processing responsibilities to business units. Because of the geographic spread of customers, the communications infrastructure was of critical importance to the banks, and in all firms it was managed centrally. Automated teller machines (ATMs) were an essential part of the customer services and facilities of each bank. However, there were differences in the number and availability of ATMs and in the extent and nature of ATM linkages with other banks and financial institutions. All banks were in the process of equipping branches with personal computers, although for different purposes.

Study findings

The findings of the study are reported in two stages. First, the relative positioning of the banks is identified through the number and nature of strategy-enabling IBCAs. These IBCAs were seen as evidence for the alignment of business and information strategy.

The second part of the findings explores possible reasons for this positioning by examining the specific organizational practices of the banks. Differences in organizational practices provide evidence for the identification of 15 propositions about alignment. Six of these propositions are in the area of firm-wide strategy-formation processes, three in organizational structure and accountabilities, four in I/S responsibilities and practices, and two in technology strategy.

Positioning of the firms. The information-based positioning of the firms was identified initially through response form answers and then followed up in the interview sessions. Three questions on the response form sought perceptions about advantages in relation to use of information or information technology, or both, by the bank. The first two questions asked managers to rate how

Table 2 Overall information-based positioning: executive manager response

Section of the Bank	Bank 1	Bank 2	Bank 3	Bank 4
Number of executive manager participants	4	4	5	5
1. Bank as a whole, compared to competitors: Means	3	3.1	4.4	3
2. Bank as a whole, compared to competitors: SDs	0	0.22	0.49	0.89
3. Retail banking, compared to competitors: Means	3	3	4	2.8
4. Retail banking, compared to competitors: SDs	0.71	0	0	0.75

well their firm made use of information-based advantage for the "bank as a whole" and then for the retail banking area when compared to competitors on a Likert scale of 1 (low) through 5 (high). A low rating (1-2) indicated a position behind competitors, 3 was average, and above that (4-5) was ahead of competitors. The means and standard deviations of the responses from executives are depicted in Table 2.

Bank Three was the only bank where all executives indicated that the bank had at least an above-average position in relation to competitors, both for the bank as a whole and for the retail area. Executive managers in Banks One and Two generally ranked their own firms as average performers in their use of IBCA. Bank Four executives indicated the greatest level of variance regarding their responses in both areas, and the lowest mean for the position of the bank in the retail area.

In the interview sessions, the executives in each bank were asked to indicate which of their competitors could be considered to be the best positioned at present. Their responses confirmed that Bank Three was currently in front, though potential future positioning was more fluid.

In a subsequent response form question, executive managers were presented with a list of 18 areas of potential information-based advantages drawn from the literature[31,32] and from the initial analysis of the annual reports (1985–1987) of the banks. Managers were asked to indicate in which of these areas their firm had gained some advantage over competitors by utilizing information or information technology, or both. In interviews the importance of these advantages in the current banking industry climate was pursued. As a result, advantages were classified as high, medium, or low in importance in the industry.

Table 3 lists the areas of advantage grouped into the three levels of importance, together with the executive managers' responses from each of the banks. Each asterisk (*) denotes that one manager indicated this particular area was one where the bank had an advantage over its competitors. For example, "integration of customer data" was an area of high importance, and all five senior managers of Bank Three indicated that they had an advantage over their competitors in this area. Four of the five senior managers of Bank Four believed that their bank had an advantage in the area of "electronic home banking," but this area had a low level of importance. The average number of IBCA per participants is listed as the final part of Table 3, since the number of executive participants varied from bank to bank.

The responses shown in Table 3 were quite consistent with those to the earlier general questions on the response form. Bank One had the lowest number and smallest spread of IBCAs, which was confirmed in interviews. Bank One executives indicated that the advantage gained from their "differentiated customer products" had been dissipated because the key product developed was underpriced and used as a "loss leader."

The executives of Bank Two indicated advantages in a number of areas, but there was no area marked by all executives. In interviews, these limited advantages were discussed in terms of providing positioning advantages. Positive financial returns had not yet been achieved (nor were systems in place to indicate such returns).

Bank Three had the highest average number of IBCAs per participant. In their comments concerning the tracking of benefits, Bank Three executives focused on the interconnection between several of their information-based developments

Table 3 Information advantages and their performance

Manager Details	Bank 1	Bank 2	Bank 3	Bank 4
Number of executive manager participants	4	4	5	5
Range of number of responses	1–5	0–6	4–8	3–10
Total number of IBCAs	11	13	33	27
Average number of IBCAs per participant	2.75	3.25	6.6	5.4
Standard deviations within banks	1.7	2.5	1.9	2.7
High	**Bank 1**	**Bank 2**	**Bank 3**	**Bank 4**
Integration of customer data		*	*****	
Centralized transaction processing center	*		***	
Consolidation of applications onto uniform product base			***	
Number and availability of ATMs	***	*	**	*****
ATM interchange links with other institutions	***	**	*****	**
Market analysis, marketing		*	***	
Medium	**Bank 1**	**Bank 2**	**Bank 3**	**Bank 4**
Differentiated customer services	*	*	**	**
Differentiated customer products	***	*	*	*
Electronics funds transfer/point-of-sale terminals		***	***	***
Risk management techniques		*		
Competitor intelligence				
MIS planning and control			*	*
Low	**Bank 1**	**Bank 2**	**Bank 3**	**Bank 4**
Electronic home banking				****
Internal networking systems		**	**	**
Cost accounting			*	**
Investment and financial planning			**	*
Inventory of stock control, asset management				

that had been identified as requiring significant human and capital investment.

Although Bank Four executives had a high average number of IBCAs, these results were skewed by the fact that the number of advantages marked by executives ranged from three to ten. Even though Bank Four had a clear advantage over competitors in electronic home banking, this area was not one of advantage sought or valued by other banks. Although it had contributed to the bank's desired technology-oriented image, electronic home banking was not a profit-making service, nor was it a strong strategy-enabling IBCA.

When we met with the firms, the predominant information problem identified by executives in all of the banks was the need to improve their customer information database. As one executive articulated, Australian banks had been operating in a "production environment" rather than an "information environment" in which 20-year-old processing systems were essentially "account-based," designed for a regulated era, and "product-driven rather than customer-driven." Bank Three led its competitors in three key areas of development: integration of customer data, consolidation of products onto a uniform product base, and marketing and market analysis.

The information-based performance results were consistent with overall financial indicators, and this situation continued into 1992. In responding to the areas of advantage listed in Table 3, I/S executives were generally more optimistic than their business manager counterparts about the na-

Table 4 Nature of the strategy-formation processes

	Bank 1	Bank 2	Bank 3	Bank 4
Length of time firm-wide planning in place (experience)	4 years	3 years	7+ years	4 years
Strategic planning time frame in 1989 (focus)	Short 1-year operational	Medium 1-year financial 3-year rolling cycle	Long 3-year financial and capital 5-year economic and strategic	Long 1-year operational 5-year rolling cycle
Name of firm-wide strategic planning documentation (focus)	General Statements of intent	Complex Highly structured and formatted, statements of intent	Focused Linking plans to implementation responsibilities	(Not sighted)
Extent of firm-wide strategy iteration with business units (participation)	Limited	Extensive	Extensive	Developing

ture and extent of the information-based advantages of their bank.

In this study, evidence for business and I/S strategy alignment was sought in the number and nature of strategy-enabling IBCAs. On the basis of both the quantitative and qualitative evidence, Bank Three had the highest level of alignment between its business and information strategies. Although Bank One was clearly the laggard, the relative positions of Banks Two and Four were more complex. Bank Two had the second lowest number of IBCAs per participant and the second highest variance among the four banks. Bank Four executives indicated a relatively high number of IBCAs, but these were not necessarily in areas competitors considered important.

Explanations for the comparative positioning of the firms is now explored under four headings: firm-wide strategy-formation processes, organizational structure and accountabilities, I/S responsibilities and policies, and technology strategy.

Firm-wide strategy-formation processes. Differences among the strategy-formation practices of the banks were evident in three major areas: the nature of their strategy-formation processes (experience, focus, and participation), their strategic orientation characteristics (consensus, clarity, and consistency), and the way in which management reviewed I/S strategy.

This study provided evidence for six propositions related to firm-wide strategy-formation processes. The alignment of business and information strategy was facilitated by the following propositions:

1. Longer experience of firm-wide strategic planning processes
2. Planning that focuses on critical and long-term issues
3. More extensive participation in firm-wide planning
4. Executive manager consensus on firm-wide strategic orientation
5. Clarity and consistency in strategic orientation
6. More extensive executive manager experience reviewing I/S strategy

Each of these areas is discussed more fully below.

Nature of strategy-formation processes (Propositions 1–3). A summary of the data from the evidence about the nature of strategy-formation processes is presented in Table 4.

Three of the banks had four years or less experience in firm-wide strategic planning; Bank Three had more than seven years experience. The date of commencement for Banks One, Two, and

Four largely coincided with the first full year of deregulation and the entry of foreign banks into Australia.

The strategy-formation processes of Bank One had only a one-year time frame and was almost completely operationally focused. Bank Two had very extensive and complex strategic planning documentation, which required a manual so that business units developed their plans in the appropriate format. Bank Three had much less extensive documentation than Bank Two, but it was more focused, with responsibility for the implementation of plans clearly linked to named individuals and specific groups. In the words of the strategic planning manager of Bank Three: "We are trying to make the strategy formation process less formal, more flexible [and] more issue oriented."

From this evidence it appears that the length of experience in firm-wide strategic planning in the banks brought with it greater confidence, competence, and increased involvement and participation across the firms. Effective planning processes are likely to be related to experience and the greater opportunity for permeation into other than only the top levels of management.[33] At the same time, there may be a better balance between analytical processes and intuitive judgments, as suggested by McGinnis[34] and evident in Banks Three and Four.

There is considerable debate concerning the extent to which formal planning processes enable or hinder the identification of strategic information technology opportunities (see, for example, References 35 through 38). In tracing the initiation, justification, and development of information-based advantages in each bank, a consistent pattern emerged. About half the major IBCA initiatives had evolved as part of the firm-wide processes of the bank, whereas the other half were initially individual initiatives, championed by particular managers, in the manner of innovation management (see References 39, 40, and 41).

The individual innovation-type initiatives generally related to the exploitation of specific applications or specific technologies. The important advantage of "market analysis, marketing," cited by Bank Three was an example of a business-led initiative of the innovation type. Bank Four's electronic home banking was a technology-led advantage, which was not seen as a desirable or important advantage by the other banks.

Significant advantages that required technological infrastructure support, such as "integration of customer data" and "consolidation of applications onto a uniform product base," were more likely to have evolved from formal firm-wide and business-led processes. Over time, as individual innovation-type initiatives became more important to the bank, their ongoing development tended to become embedded into firm-wide processes as with the infrastructure investments.

Executives in two of the four banks indicated a concern with confidentiality in involving employees in the strategy-formation process as it evolved and in more widespread communication of strategic thrusts and developments within their firms. They then faced a dilemma that too few employees were aware of the directions of their business. In the information systems context, participation is more effective in developing a sound understanding of top management objectives than simply communication of that strategy at a later date.[42,43] Findings in the banking study suggest the need for a tradeoff between strict confidentiality and an informed and committed work force.

A major factor in a bank developing a realized I/S strategy consistent with business needs was a flexible and issue-oriented strategy-formation process, with concurrent processes taking place at different organizational levels (a combination of Propositions 2 and 3).

Strategic orientation characteristics (Propositions 4–5). An indication of the strategic orientation of the banks was sought as part of the initial input from executive managers. The strategic orientations were drawn from Wiseman's "theory of strategic thrusts,"[44] which in turn has its base in the work of Chandler[45] and Porter.[46] Analysis of these responses, plus interviews, documentation, and annual report analysis provided substantial evidence to indicate that the banks had different levels of consistency and consensus concerning their strategic thrusts. Table 5 outlines these findings while retaining confidentiality. Bank Three had the highest level of consensus and consistency in its strategic orientation, followed by Bank Four.

Table 5 Strategic orientation characteristics

	Bank 1	Bank 2	Bank 3	Bank 4
Consensus re strategic orientation	Medium	Medium	High	Medium to high
Consistency of strategic orientation	Low to medium	Low	High	Medium to high

Table 6 Management experience with reviewing information strategy

	Bank 1	Bank 2	Bank 3	Bank 4
Reviewing of IS/T in firm-wide strategic planning	Limited, general, incidental references	1989+: extensive and mandatory references to IS/T requirements	1985+: part of business strategy-formation process	1990+: formally linked to IS/T plans
Overt linking of business and I/S strategies and plans	Not in place	1988+	1985+	1989+

Research findings on the importance of consensus among senior managers concerning organizational ends and means are ambivalent.[47–49] Evidence from the banks lent support to the importance of gaining some executive management consensus concerning predominant strategic orientations, as a means to organizational ends. Where that consensus was more evident, there were more extensive and more strategy-enabling examples of information-based comparative advantage.

Although authors such as Parker[50] identified the importance of linking I/S to objectives of the firm, the assumption is often made that these objectives are clear and consistent. The importance of clarity and consistency has been observed recently by Hirschheim[51] and Lederer and Mendelow.[19] In the banks in this study, it appeared that consistency in strategic orientation over a period of time provided greater opportunities for business and information strategy alignment.

This study supported the proposition that the process of well-developed strategic planning provides a rich information channel in the reduction of uncertainty and clarification of ambiguity.[52–54] Sound planning processes constitute institutional learning,[55] where the process is more important than the product. This planning lays the groundwork for the clarity and specificity of business strategy from which the information strategy of the organization can be concurrently planned and realized.

Executive management reviewing I/S strategy (Proposition 6). In this study, all executive managers indicated that they believed that their bank was highly dependent on information systems. The strategic documentation of each bank at least mentioned the role and importance of information systems and technology. This study sought more discriminating indicators by drawing on the nature and context of references to information technology in strategic documentation, the interview responses of executives, and the analysis of annual reports.

Major differences between the banks are summarized in Table 6. Bank Three had the most lengthy experience of attempting to overtly link business and information strategic planning at the firm-wide level. In recent times, Banks Two and Four had made major advances in explicitly linking business strategies with their information systems and technology implications and requirements. Bank One's consideration remained general with overt linking underdeveloped.

The content analysis of the CEO letters in annual reports provided additional evidence of the centrality of information technology to strategic ori-

Table 7 Concentration of I/T phrases in CEO letters

Indicators	Averages from 1985–1989				
	Bank 1	Bank 2	Bank 3	Bank 4	Average
1. Number of I/T phrases per paragraph	0.17	0.15	0.3	0.3	0.23
2. Percentage of paragraphs with I/T phrases	12	9.2	14	13	12

entations in each of the banks (See Table 7). In quantitative terms, Bank Three had the highest number and concentration of I/T phrases in annual reports. From a qualitative perspective, Bank Three showed the earliest attributions of I/T to strategy, with the later reports of Bank Four making the link more explicit. The path of I/T developments for each bank portrayed in the annual reports closely resembled that gleaned from executive managers and from strategic planning documentation.

Organizational structure and accountabilities (Propositions 7–9). Three aspects of organizational structure and accountabilities were important in underpinning the ability of a bank to properly link business and information strategies. These aspects provide evidence for Propositions 7, 8, and 9. The alignment of business and information strategy is facilitated by:

- Organizational structure that complements strategy (Proposition 7)
- Decision-making processes appropriate to strategic orientation (Proposition 8)
- Accountabilities appropriate to strategic orientation (Proposition 9)

The need to link strategy and structure is well-embedded in the organizational design literature. Although all four banks had some form of divisionalized structure in place, the level and nature of responsibilities delegated to the business units varied. One bank, with a predominant strategic orientation of product and service differentiation, had an organizational structure with accountabilities and responsibilities that mitigated against this strategy. Devolution of responsibility for and incentive to develop new products and services was minimal. A low level of business ownership and initiation of information systems developments typified the IS/T area.

In three of the firms, increasing emphasis was being given to the balance of responsibilities, particularly in the information systems and technology area. The major IS/T corporate-level responsibilities were in the development and approval of technological architectures and the oversight of centralized transaction processing systems. These responsibilities were progressing simultaneously with increased provision for decentralized or distributed access and usage. Banks Two and Three had the most highly developed forms of devolved responsibilities in other areas. Bank Two had gone through a process of heavy devolution in the mid-1980s, some of which it was reversing because of compatibility and control problems.

The importance of the match between firm-wide structure and responsibility arrangements and strategic orientation was further illustrated at the functional level in the structure, responsibility, and accountability arrangements for information systems.

Information systems responsibilities and policies. Different I/S responsibilities and policies provided evidence for propositions 10 to 13. The alignment of business and information strategy is facilitated by:

- Business management responsibility for information-based developments (Proposition 10)
- Extensive interaction between business and IS/T staff (Proposition 11)
- Development of IS/T understanding in business managers (Proposition 12)
- Development of business skills in IS/T managers (Proposition 13)

Responsibilities for information-based developments (Proposition 10). The most effective management of information systems seemed to take place when these resources were managed by those who were closest to business needs. As-

Table 8 IS/T and business relationships and responsibilities

	Bank 1	Bank 2	Bank 3	Bank 4
IS/T and business unit relationships	Difficult, strained	Turnaround situation	Mature, business ownership	Turnaround situation
Previous driver of IS/T developments	IS/T group	IS/T + business	Business units	IS/T group
Ownership of IS/T projects	Corporate-level IS/T group	Some corporate-level IS/T group Some business unit ownership	Business units	Corporate-level IS/T group

pects of the information systems and technology relationships and responsibilities are summarized in Table 8. Bank One executives felt much frustration about and little ownership of information systems developments. Banks Two and Four were in the midst of major changes initiated at the corporate level to their organizational arrangements for information systems and technology, strategic decision making, and ownership issues. These banks were seeking to move to the type of ownership and federated arrangements identified in Bank Three. The major impetus for such arrangements was a more responsive ability to introduce new products and services based on customer information and market analysis.

When we met with the firms, Bank Three executives were the most positive about the match between their organizational structure, strategic orientation, and information-oriented structures and processes. Bank One executives were the least positive. Bank Three had a centralized transaction processing system together with a relatively high level of devolution of responsibility to business units for developing products and services, provided they were within the firm-wide strategic and technological parameters. Each information systems development was owned by a business unit, and each I/S project or steering committee was chaired by a manager from the business unit.

Interaction between business and IS/T staff (Proposition 11). The contact between IS/T personnel and business units, based on responsibility and accountability arrangements, was the most extensive in Bank Three. The lack of such interaction was lamented by executives in two of the other banks. Direct contact between the "I/S function and line divisions" and greater "line influence" on I/T were found by Johnston and Carrico[44,45,56] to be important factors supporting strategic utilization of I/T. The presence of six of seven of Feeny's characteristics of firms with high business and information systems integration was evident in Bank Three.[30] The seventh related to cost and profit center approaches. The approach of Bank Three was mixed, depending on the nature of the activity.

Development of business and IS/T managers (Propositions 12–13). The federated arrangements outlined above require new skills of both business and information managers at many levels.[40,57,58] Banks Two, Three, and Four had each recognized the changing educational and experiential needs of both business and information personnel. These banks were making conscious efforts to manage the interrelationships between business units within firms and to transfer middle and senior personnel between functions and task forces, in the manner recently suggested by Johnston and Carrico.[56] As one strategic planning manager stated, "I would never run a big financial services organization with a technologist on top, but I would have the core business managers being much more technologically literate than they generally are."

Banks Two and Four had recently appointed staff members in the IS/T area who had strong business or strategy backgrounds, or both, in order to improve the business orientation of technological developments. Bank Three had had staff development practices in place for seven years in order to give potential senior business managers experience in managing technology projects. Their IS/T manager came from a business rather than a technological background, but had previously been given responsibility for a major I/T task force.

Technology strategy (Propositions 14 and 15). In this study, technology strategy focused on decisions concerning the hardware, software, and communications components of information systems. Two aspects of technology strategy appeared to be particularly important in the alignment of business and information strategies. Propositions 14 and 15 suggest that the alignment of business and information strategies is facilitated by:

- Appropriate technology architectures (Proposition 14)
- I/T to suit the generation of required information products and services (Proposition 15)

Well-developed strategy-formation processes should result in identification of a preferred range of information-based products and services to meet firm-wide and business unit needs. The ability of the firm to develop these products and services depends on:

- The suitability of the technology already in place
- Processes for changing or supplementing that technology as required
- The decision-making processes that enable the development of those products and services when the technology becomes available

At the time of data collection, Bank Two was developing a firm-wide approach to agreed technology architectures to enable the more rapid development of products and services. A period of excessive divisionalization and decentralization, during which virtually all technology decisions were devolved to business units, had resulted in incompatible systems. Some compatibility in the form of agreed architectures was required when developing products across business units. The introduction of Bank Three's information-based advantage of "integrated customer data" required changes in the centralized transaction processing system of the bank. However, once those changes were made, the development of subsequent products did not require major systems changes.

The 15 propositions presented were developed from an analysis of organizational practices that appear to facilitate the emergence of strategy-enabling information-based advantages. These key organizational practices are now presented in an alignment model that depicts the relationships between these practices.

Alignment model

Aligning business and information strategies is a difficult process. In the banks, it required a complex and contingent set of strategic, organizational information systems and technology arrangements. The emergence of strategy-enabling information-based advantages required a firm to have consistent practices in four areas: firm-wide strategy-formation processes, organizational structure and accountabilities, I/S responsibilities and policies, and technology strategy. Consistent and superior practices in all four areas were needed for industry leadership.

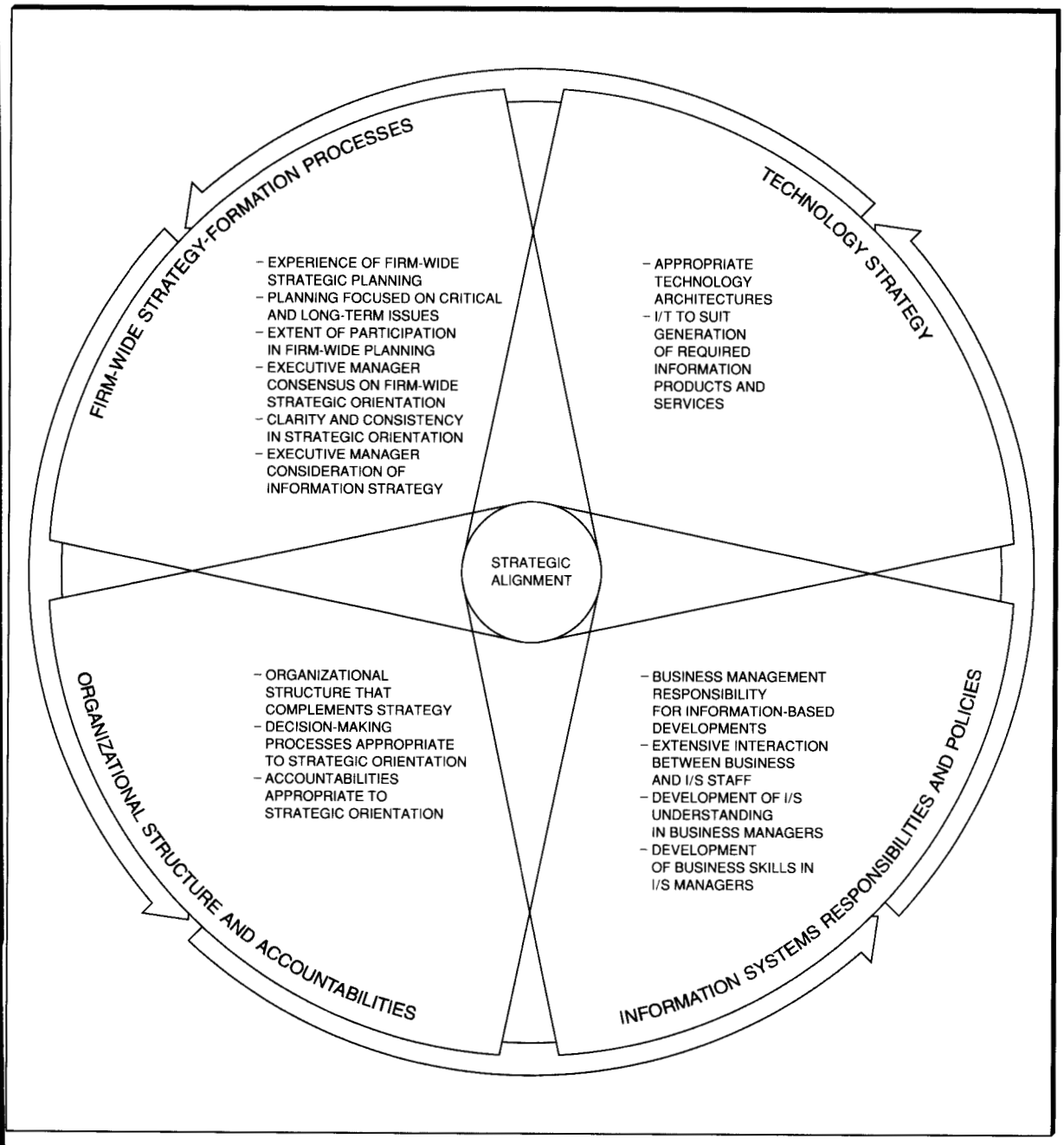
Figure 1 presents a working model of alignment, with these practices grouped into the four areas that provided the basis for the research questions. This model does not claim to be comprehensive, but rather is illustrative of practices for which there is grounded evidence in large firms in the finance industry.

In the banking industry, commencing with a focus on strategy-formation processes appeared to be the most effective way to achieve alignment. Directing efforts initially toward technology strategy, as was evident in Bank Four, resulted in advantages that were low in their level of importance in the industry. The situation might be different in other industry areas or in smaller firms where the lead time for significant developments is shorter.

From our observations, then, the four areas depicted in Figure 1 should be addressed in order, commencing with firm-wide strategy-formation processes through organizational structure and accountabilities, to information systems responsibilities and policies, and then to technology strategy. Following this process maximizes the opportunities for alignment. At the same time, sound development of technology strategy, the fourth stage of the process, would increase the extent to which technological decisions would then stimulate further business considerations and options.

This alignment model is consistent with two other recent models, those of Earl[40] and of Henderson and Venkatraman,[59] identified while this study

Figure 1 Alignment model



was in progress. The Australian banking study emphasized the interconnections between the quadrants and the importance of firm-wide strategy-formation and implementation processes. Strategic decision-making processes were not as clear-cut as in the Earl model, with some aspects of both information services and technology strategies requiring corporate or board-level decisions and oversight.

Though limited to one industry area, this study has provided some evidence about organizational practices that facilitate business and information strategy alignment. Banks have had to be at the forefront of attempting to link their business and information strategies. Thus we can learn from reviewing practices that facilitated alignment in this information-intense and competitive industry.

Effective management practices

More effective linking of business and information strategies was evident where the following practices were in place:

1. Sharply focused strategy-formation processes that identified implementation responsibilities. There was a clear indication of who was responsible for achieving specific targets, together with target dates. Strategic planning was not a once-yearly exercise but an ongoing process with progress reviews taking place at regular intervals.
2. Active involvement in firm-wide strategy-formation processes, which enhanced knowledge of the content of strategic directions, built relationships, and increased the dialog between different business and functional managers, particularly business and I/S managers. There was a feeling among I/S groups that they were in the business of the firm, rather than in the I/S industry.
3. Purposeful communication of the strategic directions of the firm throughout functional areas. This communication enhanced commitment to firm-wide strategies and to business solutions. There was an accepted tradeoff here between certain levels of confidentiality and the ability to deliver the required outcomes to the business.
4. Business ownership of I/S with appropriate levels of decision making. This combination entailed an I/S portfolio approach, with responsibility for infrastructure and I/T platform planning at corporate levels and applications planning at business levels. The result was an increased capacity to transform business processes using systems and technology, with the focus on core business drivers.
5. Programs aimed at improving the business understanding of I/S staff and the I/S skills of business managers. Such interaction took the form of staff secondments (temporary or short-term appointments to another group or section of the firm), task forces, exchanges, and other formal programs. Succession management practices for senior positions involved a period of significant responsibility for an I/S plan or project.
6. Extensive and ongoing senior management responsibility for long-term I/S developments. I/S requirements had to be specified in all corporate, business, and functional-level plans.

An effective strategy-formation process requires the dual dynamics of long-term strategic focus and flexibility. A long-term view is needed to ensure that the basic infrastructure for future developments is in place when needed. This then results in a relatively stable technological framework with the capacity to provide flexibility to respond to changes in the environment and marketplace. The capacities and expectations of the staff are critical if the firm is to be a learning organization able to foresee changes required and implement them constructively without harming the business.

Reviewing management practices

Organizations seeking to enhance the alignment of their business and information strategies should review the practices of their firm with these questions in mind:

1. Articulation of strategic directions
   - To what extent is there a clear, overt, and accessible articulation of the strategic directions of the firm for its business and functional managers?
   - In what ways does the strategy-formation process and its documentation indicate clearly the roles and responsibilities of business and functional managers?
   - Are business milestones indicated?
   - What is the reviewing process that takes place to check progress on implementation?
2. Participation in the strategy-formation processes
   - Who is involved in firm-wide strategy processes?
   - Is there a cascading effect in the strategy-formation process with consistency evident in different levels of planning outcomes?
   - Are there avenues to capture the ideas and initiatives of line and support managers?

3. Communication of strategy-formation outcomes
   - What mechanisms do senior managers use to convey necessary information to those in functional, line, and support areas?

4. Business ownership of I/S developments
   - Is there a clear statement of responsibilities for different types of systems and technology decisions?
   - Is there sufficient responsibility accepted at corporate levels for decisions about infrastructure investments that affect all parts of the business?
   - Are responsibilities for applications and other development opportunities as close as they should be to business-level decision making about products and services?

5. Business and I/S staff interaction
   - Are there specific organizational practices that stimulate and support greater interaction between business and I/S staff?
   - What type of programs in the firm are aimed at enhancing the business skills and understanding of I/S professionals?
   - How are the technological skills and understandings of business managers being developed?
   - What opportunities are there for staff secondments, exchanges, work on specific task forces, etc.?

6. Senior management responsibility
   - To what extent are the systems and technology implications of strategic decisions understood?
   - Is there a requirement for all business plans to clearly indicate the systems and technology implications and requirements?
   - Are appropriate types of justifications required for different types of technology investments?
   - When and how are these justifications reviewed?

These questions should assist firms to identify areas that might be hindering their ability to adequately link business and information strategies.

Summary

This paper explores business and information strategy alignment in the information-intensive and competitive Australian banking industry. Organizational practices that facilitate alignment are identified. From that evidence, a model of strategic alignment is presented that emphasizes the interdependence of firm-wide and I/S practices.

The study, in taking a case-based approach to one industry area, can be seen as limited in design and in the interpretive nature of the findings. However, this focus allows close examination of the business and information strategic dynamics in a leading-edge industry area.

Central to the alignment of business and information strategies is the nature of the firm-wide strategy-formation processes of the banks. Although IS/T managers place considerable importance on I/S planning methodologies at the functional level, the firm-wide processes differentiate the banks in this study. A key factor for the banks in developing a realized I/S strategy consistent with business needs is a flexible and issue-oriented strategy-formation process, with concurrent processes taking place at different organizational levels.

The most effective management of I/S occurred when these resources were managed by those closest to business needs. The extent and nature of interaction between business and I/S staff is critical to the development of an IS/T strategy that is aligned with business strategy. The bank with the best information-based positioning has a policy of appointing a business manager (rather than an IS/T manager) to head the IS/T group at the corporate level.

This paper has identified organizational practices that contribute to alignment and has outlined a series of questions with which managers can review the practices of their firm. Alignment of business and information strategies requires planned and purposeful management processes. Nonalignment is the natural state of organizations, and strategic alignment is temporal in nature. Enhancing business and information strategy alignment will remain a key challenge for both business and information managers in the future.

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