

Pre-EDI Cost-Benefit Analyses: A Case Study in an Insurance Company

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Abstract

As an element of Electronic Commerce (particularly supply chain management), Electronic Data Interchange (EDI) has the potential to sustain competitive advantage for individual companies, yet the adoption of EDI has been considerably slower than anticipated. One of the major reasons for this slow uptake is the difficulty in justifying the high investment cost of EDI. Very little research has been undertaken into whether EDI is actually cost-effective, despite its adoption cost. This paper presents the result of a cost-benefit analysis into a pre-EDI system within a Melbourne-based insurance company. The results indicate that EDI projects can be justified and, furthermore, that EDI has the ability to provide real benefits within the insurance industry.

Introduction

Electronic Data Interchange (EDI) is defined by Emmelhainz (1990) as “the inter-organisational exchange of business documentation in a structured, machine-processable form” (p 4). It has the potential to remove significant time and money from the existing business procedures through the dematerialisation and automation of inter-organisational business document transmission. Thus, EDI allows enterprises to respond to new opportunities and to the constant pressure for greater productivity, efficiency and responsiveness to the customer’s needs (Gottardi and Bolisani 1996).

Despite the many benefits of EDI and the fact that the quality and price of computers and communications equipment have improved significantly over the past two decades, many organisations, particularly small and medium sized enterprises, are still reluctant to adopt EDI (Parker and Swatman 1995; Tung and Turban 1996). A number of reasons attributable to the somewhat disappointing uptake of EDI include, *inter alia* (Cuk 1996; Kurnia and Swatman 1997):

- lack of management awareness of the strategic benefits and opportunities EDI may bring
- the difficulty of evaluating the tangible benefits of EDI
- lack of top management commitment to the EDI implementation process

- concern with the high cost of EDI hardware, software and value-added network subscriptions
- difficulty in justifying the investment in EDI.

One possible remedy for these problems is to conduct EDI cost-benefit analysis providing significant information to assist in the decision process regarding EDI implementation. Besides serving as a decision making tool (when conducted prior to implementation), cost benefit analysis may also serve as an evaluation tool (when conducted after the implementation) (Nowak 1992; Tung and Turban 1996). Cost-benefit analysis examines the economic feasibility of a project but it is more than merely a financial appraisal of a project. It takes into account the lifetime benefits and costs, as well as the intangible benefits of an undertaking in assessing whether the project will bring improvements to the welfare of the community involved. As part of this process, intangible benefits which are unquantified, are presented with as much descriptive information as possible to be weighed alongside other quantifiable costs and benefits (Australian Department of Finance 1991; Whitten et al. 1994). Thus, the result of cost-benefit analysis can actually provide a measurement of how justifiable an EDI project is to a particular organisation.

There has been little work undertaken in conducting cost-benefit analysis of EDI projects (Nicolopoulou and Smithson 1996). The benefits of EDI are commonly regarded by management to be self-evident, going by other organisations' experiences, so that performing cost-benefit analysis is often considered to be a waste of time and resources (Roberts 1996). Hornback (1994), however, suggests that conducting cost-benefit analysis of EDI projects is essential for any organisation since there must be specific additional costs and benefits involved when different organisations undertake the same project. Unfortunately, conducting cost-benefit analysis of EDI projects is not as simple as it might appear to be. While identification and quantification of costs is relatively easy, the quantification of benefits is considerably more difficult, as this exercise requires an extensive understanding of how EDI changes business procedures (Litecky 1981; Lay 1985; Tung and Turban 1996).

In Kurnia and Swatman (1997) we described a long-term research project, designed to investigate the possibility of developing a generic EDI cost/benefit analysis metric, which could be used by all organisations considering investing in EDI. A number of individual studies were undertaken by students from Curtin and Monash Universities, over the period from 1993 to 1997, involving different industry sectors and a variety of companies, to identify the costs and benefits involved in EDI implementation. On the basis of these individual studies, it was hoped to discover whether it would be possible to develop a generic metric for EDI cost-benefit analysis. Kurnia and Swatman (1997) concluded that on the basis of the available evidence such a generic metric could be developed, as a number of common elements of EDI costs and benefits had been identified.

While the provision of a generic metric is clearly helpful for companies in identifying costs and benefits of EDI projects, an understanding of how EDI costs-benefit analysis is actually carried out is, however, also crucial. The earlier paper was, of course, not able to go into great detail about any particular analysis. The present paper therefore presents a more detailed

explanation of one of the studies involved in the overall project (which is still on-going), to provide an in-depth discussion of the EDI cost/benefit analysis process.

In particular, this paper discusses the cost-benefit analysis of the pre-EDI “Magnetic Data Interchange (MDI)” system implemented by a Melbourne-based insurance company. This study formed part of an honours project conducted in 1996, and was designed to develop a specific EDI cost-benefit analysis metric for an example insurance company (Kurnia 1996). An MDI system is considered to be a pre-EDI or pseudo-EDI system. The difference between the concepts of MDI and EDI only differ in terms of the communications medium used to transfer the data. With EDI systems, structured data are transmitted directly via a point-to-point communications link between trading partners or via a value-added network (VAN), whereas with MDI systems, structured data are transmitted via magnetic media such as tapes or diskettes (Anonymous 1996). In essence, an MDI system can be viewed as the transition from a manual to an EDI system.

The result of this study may help persuade top management to support the adoption of full-scale EDI, based on the cost savings identified which can be further obtained from the elimination of tapes/diskettes required to exchange business documents. In addition, although the cost-benefit analysis in this study is specific to the organisation under study, it can be used with comparative ease by other companies, particularly those within the insurance industry, in conducting cost-benefit analysis of MDI or EDI projects. As more companies conduct cost-benefit analyses of EDI projects, the real benefits that EDI will become more apparent, leading to more rapid adoption of EDI (Solis 1993; Tucker 1994).

Methodology

For the purposes of this study, a single case study research method was adopted. The case study was conducted within SUNCORP Advisors and Administrators, which specialise in superannuation. It involved analysis of the Magnetic Data Interchange (MDI) activities of the company’s Contribution Collection Payment systems and Transfer Protocol Rollin and Rollout systems. The data gathering techniques employed in this study were interviews, observation and documentation review.

The study specifically involved an exploration of the costs and benefits, both tangible and intangible, of the company’s MDI projects as opposed to those of paper-based systems. Cost-benefit analysis was conducted to demonstrate that the benefits obtained from the MDI system outweighed the costs, supporting the adoption of MDI (and thus EDI). The indicator selected for the cost-benefit analysis was the Net Present Value (NPV) approach, wherein a project is favourable if the NPV of such a project is positive. The higher the NPV, the better the project.

To simplify the cost-benefit analysis process and to enhance the accuracy of the analyses, intangible benefits were left unquantified, as no consistent approach yet exists to provide realistic estimates of such benefits (Litecky 1981; Lay 1985). These benefits were, however, presented with as much descriptive information as possible.

EDI within the Superannuation Industry

Because of the increase in the volume of transactions being processed, the superannuation industry as part of the life insurance industry has realised the importance of electronic commerce such as EDI. In order to remain competitive with other financial services industries, particularly the banking industry, the superannuation industry must streamline its business processes by incorporating EDI. The ultimate goal of the introduction of EDI to this industry is the creation of a paperless environment, in which efficiency in investment and members' benefit management can be improved dramatically. Consequently, the industry will be able to offer better quality service to customers (Beasley 1996; Kalakota and Whinston 1996).

Essentially, the introduction of EDI into the superannuation industry requires two main thrusts. The first one is *cooperation between the superannuation industry and employers or payroll service providers* in order to streamline the process of collecting contributions from employers. The second one is *partnerships with other financial services industry participants* to improve the process of information exchange and money exchange required in rollover benefits between superannuation entities and other financial services industry members such as banking and investment managers (Beasley 1996). Below is a more detailed explanation of each of these two thrusts:

Cooperation between the Superannuation Industry and Employers or Payroll Service Providers

At present, employers must calculate, deduct and pay superannuation contributions for their employees on a monthly basis. This process is very tedious and time-consuming, particularly for large employers with an enormous number of employees. With the introduction of EDI, such contributions can be automatically calculated by the payroll system, complemented by various integrity checks to ensure correct calculations and that no members have been missed. Then, the company electronically submits a summary of the contribution payments in a standard electronic format to the relevant fund administrators (Beasley 1996; Nicol and Georgia 1996). At the same time, the total payments are electronically transferred from the employer's bank account to the fund manager's. Thus, no human intervention is required to process the contribution payment. The more employees an employer has, the greater the benefits to be reaped from EDI (Pooley 1994; Beasley 1996; SUNCORP 1996). A summary of the interactions between an employer and his/her superannuation fund administrator with EDI is depicted in Figure 1.

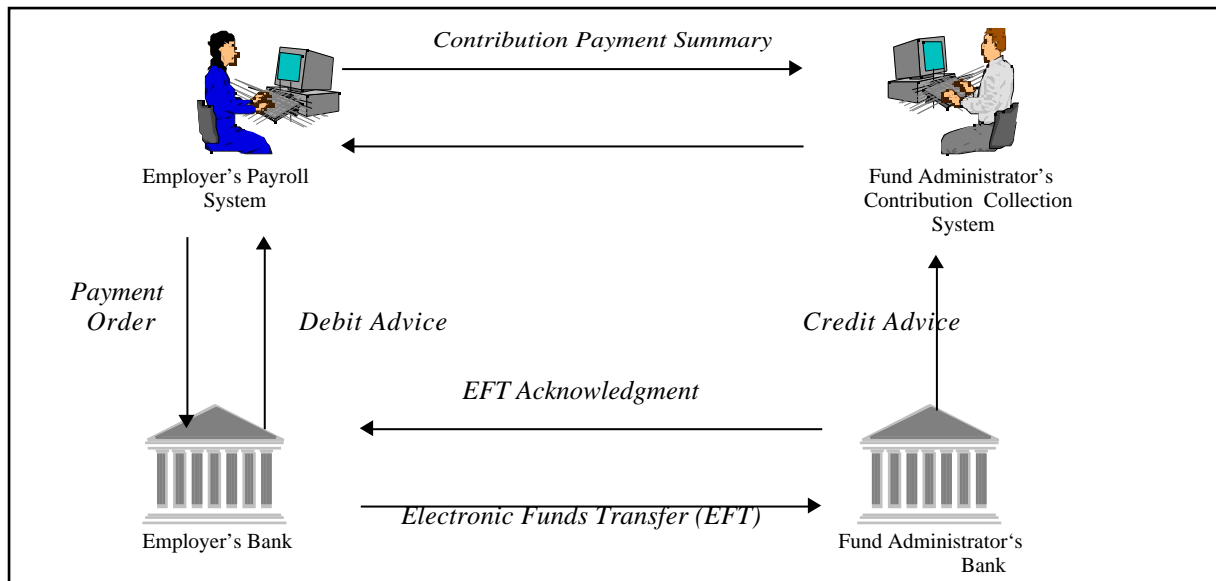


Figure 1: Employer/Fund Administrator Contribution Payment Interactions via EDI

EDI not only offers profound benefits to employers, but also to fund administrators, as the cost of collecting and processing contributions is one of the biggest costs incurred by superannuation fund administrators. Currently, the fund administrators must prepare and send monthly billing statements or Contribution Payment Return forms to employers, listing all the employees' names for each employer. Each employer, then, needs to complete the form and return it to the fund administrator with a cheque. The fund administrator has to key in the payment details for each individual member, process the cheques received, and issue receipts. With more than 80% of Australians involved in superannuation, the fund administrators are faced with enormous amounts of labour-intensive work in collecting and processing the contribution payment for each individual member. In addition, there is considerable potential for error in re-keying the payment details for each member (Beasley 1996; Nicol and Georgia 1996).

Apparently, the introduction of EDI to the superannuation industry requires cooperation with employers and payroll service providers, who must upgrade their existing payroll systems to allow the automation of calculation, deduction and payment processes. Furthermore, the systems should be able to provide information included in the Contribution Payment Return forms which can be uploaded directly into the fund administrator's computer system. Thus, the development of interface systems which provide access to the information required by fund managers is essential. The Life Investment and Superannuation Association (LISA) and Electronic Commerce Australia (ECA) have been actively developing commercial software packages to facilitate such interfaces. Payment can then be carried out electronically between the bank accounts of the employer and the fund administrator (Nicol and Georgia 1996).

Partnerships with other Financial Services Industry Participants

There are many cases where an employee works only for a short period of time for a particular employer, or works for several employers simultaneously. If this employee earns more than \$450 from each employer, the employee must have some amount paid to the superannuation fund by each employer. Usually, different employers have different superannuation funds and, consequently, the employee who changes jobs frequently will end up with small amount of contributions in several superannuation funds, which creates significant complications in terms of monitoring retirement savings and administering the funds. In addition, these small funds will not grow at a reasonable rate due to the high administration costs imposed (ASFA 1995) and will mean that the employee will not receive a satisfactory payout on retirement.

In 1995, the federal government's Superannuation Industry (Supervision) (SIS) legislation was altered to simplify the overall procedures of consolidating small accounts spread over a number of different funds. The new arrangements for funds transfer between superannuation entities are known as the *Transfer Protocol* and allows fund members to easily consolidate their superannuation funds into a single superannuation fund to minimise administration costs, increase the growth of superannuation savings and enhance their ability to monitor their superannuation savings. Furthermore, the reduction in the number of small accounts will also reduce the overall burden of superannuation administration companies as there will be fewer small accounts to protect, resulting in fewer queries and complaints to handle (ASFA 1995; ASFA 1996; Carmen 1996).

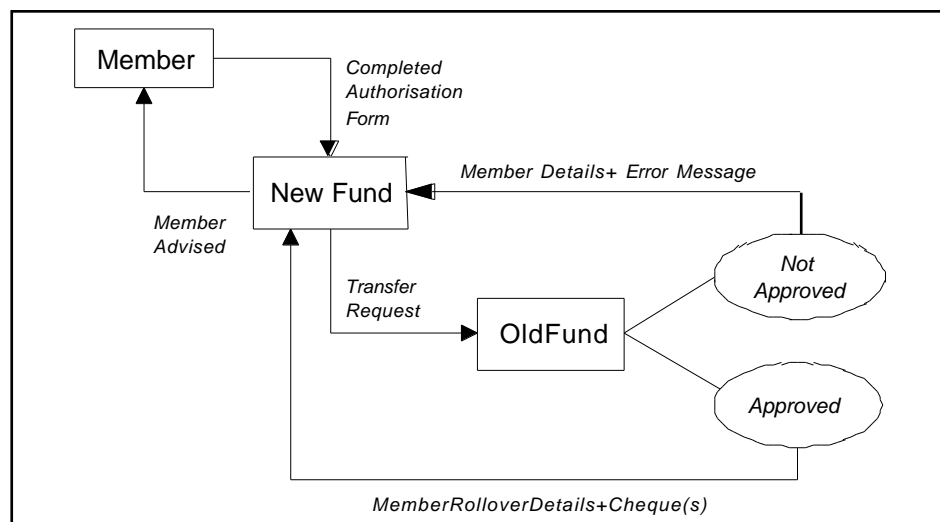


Figure 2: Process of Account Consolidation with the Transfer Protocol

The process of a fund transfer, employing the Transfer Protocol, is summarised in Figure 2. Basically, when a member wants to consolidate his/her account from the dormant/inactive account (old fund) to the current/active account (new fund), s/he needs to notify the new fund. The new fund then will send an authorisation form to the member to be completed and returned. Upon receiving the form, the new fund will check the accuracy and completeness of the form. If there is any error, the new fund will advise the member that a correction is

required. Otherwise, the new fund will request the old fund for a fund transfer on behalf of the member, by sending the original authorisation form.

Upon receiving the request, the old fund will match the member details with the existing record. If everything matches and no barriers exist preventing the member's exit, the old fund will approve the transfer request and then send the member rollover details in the form of a Statement of Termination Payment (STP) and Roll Over Payment Notification (ROPN), along with a cheque for the benefit payment to the new fund. Such a transfer is also known as a *rollout* for the old fund or as a *rollin* for the new fund. If the request is not approved, the old fund will send an error notification to the new fund regarding that particular member's details. The new fund will then advise the member regarding the result of the transfer request (ASFA 1996; Carmen 1996).

The Transfer Protocol allows the fund transfers, which include rollin and rollout, to be done manually or electronically with MDI systems, depending on the trustee of the fund. As more fund members become aware of the benefits of having a single superannuation fund, there will be a significant increase in the volume of fund transfers between superannuation funds. In such a case, EDI offers numerous benefits obtained from the simplification of the manual procedures which require enormous effort from those engaged in paper handling. The reduction of paperwork will, in turn, increase the accuracy, efficiency, flexibility and productivity of fund administration companies in processing fund transfers. Clearly, EDI implementation in fund transfers requires partnerships with other companies within the financial services industry (ASFA 1995; Beasley 1996).

The contribution collection and fund transfer processes are only part of the business procedures to be revolutionised by the introduction of EDI in the superannuation industry. In order to fully exploit the potential of EDI, however, a radical restructuring of business processes is of core importance (Swatman 1993; Moriarty 1995; Anonymous 1996). Thus, streamlining the procedures for handling lost members and various tax payments and related payments to the Australian Taxation Office (ATO), as well as the procedures for investing funds with fund managers, are also essential. The use of EDI in the superannuation industry will eliminate the use of paper cheques with the ATO and investment managers. Furthermore, EDI enables superannuation fund administrators to have rapid and direct access to the latest information about investment options offered by various investment managers, enabling them to enhance profitability as funds can be better invested (Aartrijk 1993; Posluns 1994; Beasley 1996).

Environment of the Study

SUNCORP Advisors and Administrators is a part of the SUNCORP Group, which is comprised of several companies involved in a wide range of financial services, such as general insurance, building society, banking, investment management, and superannuation administration. SUNCORP Advisors and Administrators is the section of the group which specialises in superannuation. As the third largest industry superannuation fund administrator in Australia, SUNCORP Advisors and Administrators currently administers more than 70

superannuation funds and more than one million members across Australia (SUNCORP in PROFILE 1995; SUNCORP 1996).

The head office of SUNCORP Advisors and Administrators is located in Brisbane, Queensland. However, it has a *Branch office* in each State of Australia. In addition to the branch offices, there is one *National Support Services office*, which is located at the branch office in Victoria. This National Support Services office is designed to centralise the business processes and one of its facilitators is the use of Magnetic Data Interchange (MDI) to exchange information between superannuation entities. In 1996, MDI had automated some of the business processes involved, such as processing contribution collection, handling lost members (non-contactable members), sending tax payments and tax reports to the Australian Taxation Office (ATO), and processing rollover from or to another MDI-participant fund administration company.

Due to the time constraints imposed on honours projects, this study only looked at the *Contribution Collection Systems* and the *Rollin and Rollout Systems*, employing the Transfer Protocol explained earlier. In SUNCORP Advisors and Administrators' current operations, these systems can be carried out both *manually* with paper-based systems and *automatically* with MDI systems. The MDI system for the Contribution Collection systems has been in operation since 1989, whereas the one for Rollin and Rollout systems has only been in use since May 1996. The fact that these areas have high volume transactions offers excellent opportunities for the introduction of EDI. In the rest of the paper, the word SUNCORP is sometimes used to refer to SUNCORP Advisors and Administrators.

Cost-Benefit Analysis – The Case Study

This study adopted the following main steps involved in conducting the cost-benefit analysis as suggested by the Australian Department of Finance 1991.

The Scope and Objective of the Analyses

The scope of the analysis is the Contribution Collection and Transfer Protocol Rollin and Rollout systems of SUNCORP Advisors and Administrators, Victorian Branch. In addition, the analysis was confined to the Support Services and Funds Administration areas, which belong to the Administration section of the Victorian branch.

The objective of the analysis was to evaluate whether the implementation of the MDI systems in both the Contribution Collection and Transfer Protocol Rollin and Rollout systems at SUNCORP Advisors and Administrators was justifiable. In so doing, the entire lifetime of these systems was considered. The lifetime of the MDI system for the Contribution Collection systems was estimated to be 10 years (1989 to 1998), whereas the one for the Transfer Protocol Rollin and Rollout systems was estimated to be 5 years (1996 to 2000).

The Constraints

Past year data (pre 1996) used in the analyses were mostly estimated data, due to the impossibility of tracing back all the necessary data within the full lifetime of the MDI system for the Contribution Collection Systems, which had been implemented in 1989. The estimation techniques employed in this analysis were a combination of the '*Price-to-Win*' technique and '*Professional Judgment*' technique.

Furthermore, the time frame imposed on this study affected the completeness and accuracy of the analysis. Sensitivity analysis to reduce the uncertainty of the estimation of costs and benefits, and the equity issues which are concerned with the distribution of costs and benefits across the individuals or groups, could not be included in the analysis.

The Alternatives

These analyses compare the paper-based (manual) systems against the MDI (automatic) systems of the Contribution Collection systems and the Transfer Protocol Rollin and Rollout systems of SUNCORP Advisors and Administrators. Thus, there is only a single project to be evaluated for each case, which is the MDI project of the associated system.

The Identification and Quantification of Costs

Several costs accrued during the lifetime of the MDI projects for the Contribution Collection and the Transfer Protocol Rollin and Rollout systems. The MDI costs include some of the following common costs of EDI implementation:

- *Hardware Costs*

Initially, no additional hardware was required to run the MDI system for the Contribution Collection systems. The existing hardware, an IBM 286 PC could be utilised to facilitate the system. Thus, in 1989, no additional hardware cost was incurred.

Likewise, the MDI system for the Transfer Protocol Rollin and Rollout, which was implemented in May 1996, was undertaken using existing hardware, an IBM 486 DX2 66 PC. Hence, there was no additional hardware cost at the beginning of the MDI system for the Transfer Protocol Rollin and Rollout.

- *Software Costs*

The software used to enable the MDI system for the Contribution Collection systems was the COBOL DL1 Database. The development cost of this software was estimated to be \$5000 in 1989. The MDI system of the Transfer Protocol Rollin and Rollout itself was enabled by PERWILL EDI version 4.2 software. The cost of this software was \$4000.

- *Training Costs*

One-day training for the MDI system for the Contribution Collection systems occurred in 1989. The cost of the training was estimated to be \$500 in that year. Likewise, the MDI system for the Transfer Protocol Rollin and Rollout required one-day training period which actually cost \$1000 in the early stage of the system, based on information from the invoice held at the company.

- *Maintenance Costs*

The maintenance costs include hardware and software annual maintenance costs and software and hardware upgrade costs. The hardware and software annual maintenance costs were estimated to be \$100 and \$50 respectively, for each MDI system. The hardware was upgraded to an IBM 486 DX2 66 PC in 1994, and the cost for this was estimated to be \$3000.

The Identification and Quantification of Benefits

Four types of tangible benefits were identified from the MDI systems for both the Contribution Collection and Transfer Protocol Rollin and Rollout. These benefits are the cost savings obtained by using the MDI systems as opposed to the paper-based systems. Tables 1 and 2 summarise the benefits accrued during the lifetime of the MDI projects for the Contribution Collection and the Transfer Protocol Rollin and Rollout, respectively. The calculation of benefits is based on the difference between the number of MDI transactions under the MDI system and the manual system since, if the MDI system did not exist, the MDI transactions would have to be treated manually. Thus the difference between the two is the cost savings obtained from the MDI system. Some of the benefits, particularly "*Preparing Document Labour Cost Savings*" are very small due to the small MDI transaction volume and the difference in preparing documents under MDI and manual systems is subtle. The breakdown calculations of the benefits have been deliberately omitted in this paper for the purpose of simplification.

The Indicator

In Tables 1 and 2, the estimation of costs and benefits has been adjusted to the equivalent present value, employing a discount rate of 7%. This rate was based on the interest rate of the biggest fund administered by SUNCORP. The cumulative time-adjusted benefits minus costs of each system are also presented. The final cumulative value is equivalent to the Net Present Value (NPV) of the MDI project for each case.

From Table 1, the NPV of the MDI project for the Contribution Collection systems is shown to be **+4,715**. This means that SUNCORP will gain \$4,715 throughout the lifetime of the MDI system for Contribution Collection. In addition, the analysis shows that after eight years of using MDI in this particular system, SUNCORP's accumulated benefits outweighed the costs. On the other hand, the MDI project for the Transfer Protocol Rollin and Rollout systems has a much greater NPV (**+54,963**), as depicted in Table 2. The analysis shows that

SUNCORP will gain \$54,963 by having the MDI system for the Transfer Protocol Rollin and Rollout and the benefits overtook the costs in the first year. All these figures were calculated using a number of assumptions.

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Costs of MDI System										
Hardware Costs										
PC IBM 286	-									
Software Costs										
COBOL DL1 Database	(5,000)									
Training Costs										
One-day Training	(500)									
Maintenance Costs										
Hardware Maintenance		(100)	(100)	(100)	(100)		(100)	(100)	(100)	(100)
Hardware Upgrade						(3,000)				
Software Maintenance		(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
Discount Factor for 7%	1.67	1.50	1.40	1.31	1.23	1.14	1.07	1.00	0.93	0.87
Time-Adjusted Costs (to Present Value)	(8,832)	(225)	(210)	(197)	(184)	(3,492)	(161)	(150)	(140)	(131)
Cumulative Time-Adjusted Costs Over Lifetime	(8,832)	(9,057)	(9,267)	(9,464)	(9,648)	(13,140)	(13,300)	(13,450)	(13,590)	(13,721)
Benefits of MDI System										
Document Cost Savings	97.40	116.28	139.76	168.42	201.91	241.38	289.88	348.80	418.66	502.76
Preparing Document Labour Cost Savings	6.63	8.23	10.22	12.71	15.8	19.65	24.37	30.17	37.6	46.67
Processing Related Cost Savings	422.58	523.80	650.10	806.15	1000.41	1241.49	1525.30	1903.53	2349.97	2901.29
Error Correction Cost Savings	32.67	41.32	50.53	60.35	74.94	94.82	116.48	147.73	181.51	222.45
Discount Factor for 7%	1.67	1.50	1.40	1.31	1.23	1.14	1.07	1.00	0.93	0.87
Time-Adjusted Benefits (to Present Value)	898	1,035	1,193	1,373	1,584	1,829	2,093	2,430	2,792	3,208
Cumulative Time-Adjusted Benefits Over Lifetime	898	1,933	3,126	4,499	6,083	7,912	10,005	12,435	15,228	18,436
Cumulative Lifetime Time-Adjusted Costs + Benefits	(7,934)	(7,124)	(6,141)	(4,965)	(3,564)	(5,227)	(3,295)	(1,015)	1,637	4,715

Table 1: Cost-Benefit Analysis (in \$) for the MDI Contribution Collection System of SUNCORP Advisors and Administrators

	1996	1997	1998	1999	2000
Costs of MDI System					
Hardware Costs					
IBM 486 DX2 66 PC	-				
Software Costs					
PERWILL EDI 4.2 Software	(4,000)				
Training Costs					
One-day Training	(1,000)				
Maintenance Costs					
Hardware Maintenance	(100)	(100)	(100)	(100)	(100)
Software Maintenance	(50)	(50)	(50)	(50)	(50)
Discount Factor for 7%	1.00	0.94	0.87	0.82	0.76
Time-Adjusted Costs (to Present Value)	(5,150)	(140)	(131)	(122)	(114)
Cumulative Time-Adjusted Costs Over Lifetime	(5,150)	(5,290)	(5,421)	(5,544)	(5,658)
Benefits of MDI System					
Document Cost Savings	787.59	899.46	994.10	1028.75	924.01
Preparing Document Labour Cost Savings	44.89	55.75	69.24	85.98	106.76
Processing Related Cost Savings	8,163.85	10,140.95	12,598.00	15,653.03	19,452.56
Error Correction Cost Savings	-	-	-	5.12	5.30
Discount Factor for 7%	1.00	0.94	0.87	0.82	0.76
Time-Adjusted Benefits (to Present Value)	8,996	10,370	11,932	13,692	15,631
Cumulative Time-Adjusted Benefits Over Lifetime	8,996	19,367	31,299	44,991	60,621
Cumulative Lifetime Time-Adjusted Costs + Benefits	3,846	14,076	25,878	39,447	54,963

Table 2: Cost-Benefit Analysis (in \$) for the MDI Transfer Protocol Rollin and Rollout Systems of SUNCORP Advisors and Administrators

The Intangible Benefits

From the analyses of the MDI projects at SUNCORP Advisors and Administrators, the intangible benefits are the ones actually being pursued by the company because of the impact they may bring to the bottom-line functionality of the company. Ultimately, they are concerned with obtaining the highest possible level of customer satisfaction, while allowing SUNCORP Advisors and Administrators to gain and maintain sustainable profitability. These intangible benefits should be weighed alongside other tangible costs and benefits in these cost-benefit analyses. They are discussed below:

- *Improved Trading Partner Relationships*

The adoption of MDI at SUNCORP requires cooperation with other trading partners such as employers and other superannuation fund administrators. All MDI participants must agree to some standard data formats which enable them to transfer information between different applications via a magnetic medium. Good partnerships between SUNCORP and other trading partners are important to achieve the required standard data format and to improve the existing standard data format. MDI, therefore, fosters good trading partner relationships.

With stronger relationships with customers, there are opportunities to have existing customers introduce new customers to SUNCORP. Furthermore, with better relationships with other superannuation entities, SUNCORP is able to keep track of the latest issues such

as new business strategies and the introduction of new technologies to remain competitive. In addition, this enables SUNCORP to solve problems regarding members' rollover in a timely manner which, in turn, enhances customer satisfaction.

- *Enhanced Responsiveness*

Stronger relationships with trading partners allow SUNCORP to better understand customer (member) needs and be able to quickly rectify any inter-organisational problems regarding members' funds. Thus, with better relationships with customers, SUNCORP's personnel will be more willing and quicker to serve customers and solve problems and, hence, the responsiveness to customer needs can be enhanced with the introduction of MDI.

- *Improved Customer Service*

The adoption of MDI frees a number of personnel as MDI automates from a number of labour intensive tasks, which require significant manual effort. These personnel can then be assigned to other tasks, such as continuously improving customer service quality. The quality service at SUNCORP can be perceived from different dimensions such as ease of enquiry, accurate and complete information regarding any queries, competitive administration costs, a wide range of superannuation products, services and investment choices, high levels of investment security, timely and reliable benefit payments, and the like. Improvement in customer service is always a critical issue for any industry, as it directly affects customer satisfaction.

- *Improved Image*

Since there are not many organisations within the superannuation industry that have adopted MDI, SUNCORP has become one of the industry leaders in the adoption of electronic commerce. This fact improves the image of SUNCORP within the superannuation industry and across industries. With such image improvement, SUNCORP will, in turn, be able to expand its business easily, leading to a higher market share which will bring sustainable profitability to the company.

Discussion and Conclusion

These cost-benefit analyses of MDI projects for the Contribution Collection systems and Transfer Protocol Rollin and Rollout systems of SUNCORP Advisors and Administrators serve as an evaluation tool to ensure that the investment can be justified. The positive figures of the NPVs for both MDI systems and the intangible benefits identified indicate that the MDI projects of SUNCORP are, indeed, cost-effective. The reason why it takes such a long period (8 years) to have the benefits overtake the costs for the MDI Contribution Collection system is because the volume of MDI transactions is very small and, therefore, the benefits have not been exploited to their maximum potential. Thus, with more MDI participants, the payback period will be shorter as more benefits can be gained. There are a number of constraints involved in the cost-benefit analyses of this study, which impact the completeness and accuracy of the analyses. Nevertheless, the results of the analyses should

be sufficient for management to take appropriate action regarding the MDI projects at the affected company.

This study indicated that with the current limited volume of transactions using MDI, SUNCORP has reaped enormous benefits. One of the benefits is an increase in *cost savings*, which stems from the reduction in paper cost, printing cost and personnel costs. The savings in personnel costs are gained from the reduction in re-keying and error correction processes. Furthermore, the introduction of MDI technique in both systems *enhances the speed* of processing the cash allocation and rollin, as there is no re-keying of information required. This, in turn, *improves the accuracy* of the data as well as *the efficiency* and *productivity* of SUNCORP's personnel. These are the tangible benefits of MDI obtained by SUNCORP.

Further analyses have been conducted to scrutinise the effects of the increase in the volume of MDI transactions on the tangible benefits obtained for the MDI projects. Figures 5, 6, and 7 depict these effects for the Contribution Collection, Transfer Protocol Rollin and Rollout systems, respectively. The benefits shown in these figures are the total tangible benefits identified.

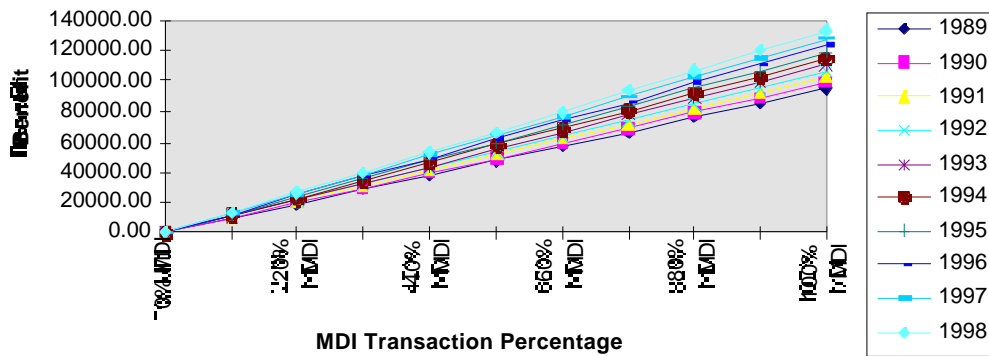


Figure 3: The Total Benefits vs. the MDI Transaction Percentage for the Contribution Collection Systems

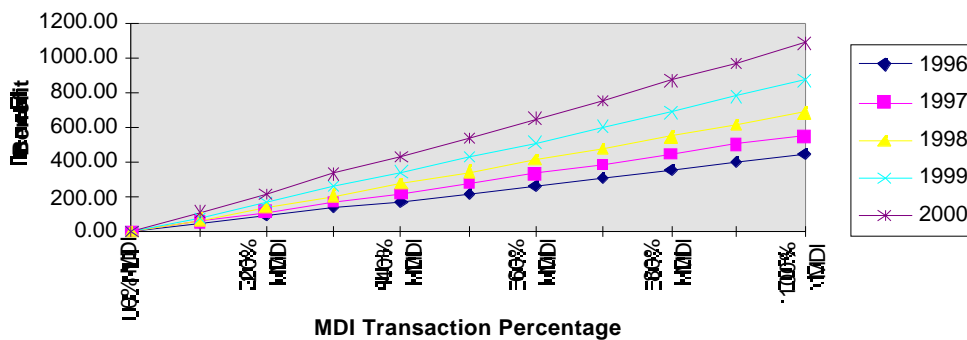


Figure 4: The Total Benefits vs. the MDI Transaction Percentage for the Transfer Protocol Rollin Systems

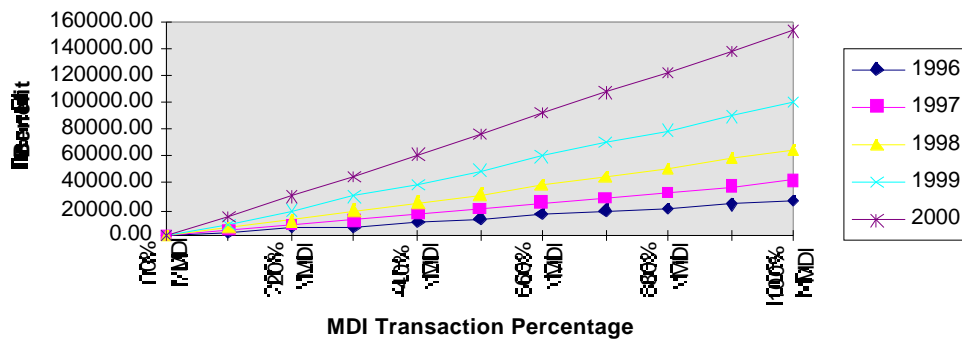


Figure 5: The Total Benefits vs. the MDI Transaction Percentage for the Transfer Protocol Rollout Systems

These further analyses explicitly show that there is a positive linear correlation between the number of documents being processed with MDI systems and the benefits obtained. Thus, the more documents processed with MDI for the Contribution Collection, Transfer Protocol Rollin and Rollout systems, the more benefits will be gained. Therefore, in order to exploit the maximum benefits of MDI, SUNCORP needs to extend the use of MDI for these systems, which can be achieved through cooperation with more employers and their payroll services providers, as well as with other superannuation fund administration companies in facilitating automatic procedures in these areas.

Based on the results of these cost-benefit analyses for the MDI systems, additional cost savings obtainable from the omission of the use of tapes/diskettes in transferring information are to be gained, if SUNCORP replaces the MDI systems with EDI systems. There will, however, be additional costs involved (such as transmission and membership costs.). Thus, depending on the selection of EDI service provider and EDI transaction volume, EDI systems may offer more strategic benefits to the company.

Future Research

A number of further studies can be carried out in relation to this study. The most relevant future research would involve conducting cost-benefit analysis for EDI projects for the same systems within SUNCORP Advisors and Administrators. It would be very interesting to know the differences in cost savings between the MDI and EDI projects and, therefore, to further assist SUNCORP in deciding whether or not to go ahead with EDI systems.

Another possible study would involve conducting another or a series of cost-benefit analyses for MDI systems of the contribution collection and transfer protocol rollin and rollout in other companies, to measure the usefulness the cost-benefit analyses produced in this study for other companies within the same industry.

Finally, a similar study could be carried out to evaluate the cost-effectiveness of employing MDI or EDI systems in handling lost members or making tax payments to the Australian Tax Office at SUNCORP Advisors and Administrators.

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