

# USING ELECTRONIC INVOICING TO MANAGE CASH FORECASTING AND WORKING CAPITAL IN THE FINANCIAL SUPPLY CHAIN

Fairchild, Alea, Tilburg University, PO Box 90153, 5000 LE Tilburg, The Netherlands,  
a.m.fairchild@uvt.nl

## Abstract

*Electronic Invoice Presentment and Payment (EIPP) can assist corporate treasurers in cash management and can be integrated with e-marketplaces and other B2B financial settlement activities. Its interactive approach to dispute resolution and robust payment options are critical if corporate financiers are to secure the advantages of B2B marketplaces and straight through processing (STP).*

*Cash management providers used to offer corporates and banks different cash management products and services, but the launch of the Euro and increasing competition have seen these solutions converge. More sophisticated corporate treasurers are currently using state-of-the-art financial tools for cash management, and EIPP can assist these corporates in a similar manner to banks.*

*This research builds on previous literature on EIPP and banking, and examines what drives EIPP adoption for financial treasurers in cash forecasting and cash-to-collections process and their use of EIPP techniques. Survey results from industry are discussed.*

*Keywords: Cash management, technology, payment, integration*

# 1 INTRODUCTION TO ELECTRONIC INVOICING

## 1.1 Background

*“Driven by a desire to get paid more quickly, companies are moving more of their invoices and payment to the Internet. Businesses care more about faster cash flow than they do about cutting costs.” (GartnerGroup, 2001).*

Electronic Invoice Presentment and Payment (EIPP) is the process by which companies present invoices and make payments to one another through the Internet, allowing businesses to view, dispute, approve and pay their bills. EIPP allows for the electronic delivery of complex business invoices while accommodating highly variable billing data structures and wide-ranging global regulations.

Through the electronic delivery of invoices, EIPP solutions offer a secure, interactive system for B2B transactions that allows organizations to cut costs by delivering significant efficiencies to the Financial Supply Chain. Example of cost efficiencies include being able to provide online dispute resolution, automatically match invoices to purchase orders, create internal audit trails, accept payments over the Internet and post the results to their accounting systems.

EIPP comes into its own with non-cyclical businesses, i.e. those that provide irregular products such as manufactured goods or materials. Often the services delivered are different each time and so payment is requested using itemized invoices. These invoices are more difficult for A/P to recognize and so it is necessary to identify who was responsible for ordering the goods, as to check the accuracy of the invoice and then match it to delivery receipts and purchase orders. B2B transactions are also more likely to be disputed than B2C transactions. Invoices are often "not paid as billed," and transactions often need to account for discounts, promotions, and special buyer relationships. It is therefore not only the process that is different for B2B invoicing, but the context of the transaction and the timing of the outcome.

## 1.2 Possible EIPP Benefits to Treasury Functions

From the corporate treasurer's viewpoint, EIPP is fast becoming one of the tools of the cash management trade, providing a significant opportunity to improve the management of daily working capital. The most obvious benefit of EIPP for a corporation is the elimination of the costs of printing and mailing invoices as well as staff costs for this extremely manual procedure (Erario, 2003). By reducing Days Sales Outstanding (DSO), this accelerates credit availability for additional sales and improves cash flow.

The benefits from reducing DSO could prove even more significant, as the introduction of EIPP will impact DSO in a number of ways:

- No mail delays
- Fewer routing delays at the customer end
- Faster dispute resolution: dispute codes aid standardisation and transparency of process since everyone has access to the latest status
- Online modification: where disputes are agreed, invoices can be quickly amended and re-issued
- Earlier notification of payment: the customer can notify the supplier via the EIPP system that a payment has been scheduled for a particular date
- Funds applied correctly and without delay: incoming remittance data can be easily up-loaded to your accounts receivable system, avoiding re-keying and misapplication.

EIPP may also offers an opportunity to present a single face to customer personnel, and increases the opportunities to cross and up-sell products and services via the site.

## 2 RESEARCH OBJECTIVE

Initial research in EIPP and banking (Fairchild, 2003a) showed that the key EIPP drivers in the current banking environment were:

- Possibility for the bank of new revenue from the increased volume of electronic payments
- Ability to charge for an added-value service
- Ability to capture new corporate customers and cross-sell additional bank solutions such as factoring services and corporate cash management.

With the research objective *to understand both the growth opportunities and barriers of B2B EIPP for corporate treasury cash management*, this research paper examines the market drivers, benefits, and barriers to adoption.

The remainder of the paper is divided into four sections. First, the theoretical background includes a review of topics that are central to EIPP. The next section examines current business models, and the following section discusses the results of a recent industry survey for drivers and barriers. The analysis of the situation in the market follows, and finally the conclusions briefly discuss implications for future research and practice.

## 3 LITERATURE REVIEW

The review of literature includes three main areas that are deemed important in conceptualizing the importance of EIPP for cash management. First, literature in strategy and transaction cost, particularly about firm level value creation (e.g. Stabell & Fjeldstad, 1998) provides a basic understanding of payment issues. Second, literature on trust and risk allows a discussion of the role of intermediaries in the EIPP value chain. Finally, the literature on IT integration enables us to discuss the implications of EIPP demands on technology processes and its implications on treasury core competencies.

### 3.1 Strategy and Value of Payment Mechanisms

EIPP, to be successful, requires the necessary critical mass of buyers and sellers to create the needed value for the electronic invoicing transaction for it to be profitably used. To explain why individual corporations cannot do the asset transformation (maturity, denomination, risk and liquidity) activities by themselves, Benston and Smith (1976:215) introduce transaction costs. They attempt to explain why individual corporations do not perform asset transformation themselves as a function of the transaction costs incurred in conducting such activities. As shown in transaction cost economics, the cost of the infrastructure is reduced per transaction when the volume of transactions increases.

To create a financially viable EIPP solution, corporates needs to create this critical mass by a value network of alliance partners and technology solution providers to add the necessary desirability for electronic invoicing through the Financial Supply Chain. A Value Network is a web of relationships that generates economic value and other benefits through complex dynamic exchanges between two or more individuals, groups or organizations. The Value Network models mediating firms as creating value through three basic primary activities: network promotion and contract management; service provisioning; and infrastructure operations (Stabell and Fjeldstad, 1998). In a network firm (Economides, 1996) the customers are offered direct access to each other, as in payment mediation, or indirect access to a common pool, as in saving and loan services (Stabell and Fjeldstad, 1998) through the set of mediation activities performed by the firm.

Both value and cost are postulated as driven mainly by network characteristics (Stabell and Fjeldstad, 1998). Value and costs depend on the number of access points (network size effects), nodes or users that can be reached (positive demand externalities), and the variety of links between users (services provided). The costs for the users are in terms of charges for access to and use of the network, while

the value is determined by the possibility to reach a large and relevant number of nodes through a variety of links. To provide greater value, value networks can increase their range of services offered by layering new services on top of the contract set and the infrastructure, (vertical expansion of service range) or increasing access to a larger pool of users (horizontal expansion of network scope).

Electronic financial supply chain players need to streamline the settlement process in terms of both workflow and transaction cost by creating e-marketplaces with *standardized settlement mechanisms* via a finite number of trusted providers with both the range of necessary solutions and the openness and reach to enable transactions throughout the e-marketplace.

Buenger et al. (1996) provide a framework of competing value drivers, indicating that organizations face different value propositions, which may change over time due to internal and external influences and experiences (Figure 1). In the case of collaborative EIPP solutions, pivotal drivers are the development of flexible, yet standardized settlement mechanisms to realize value (Fairchild and Peterson, 2002).

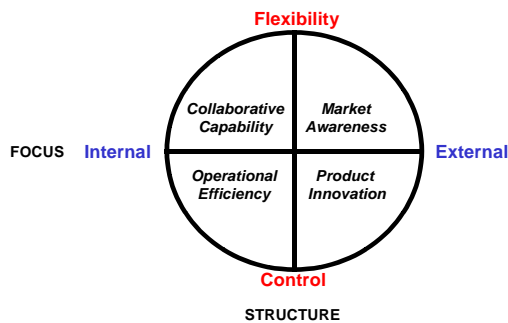


Figure 1. Competing Values Drivers (Adapted from Buenger et al., 1996).

In this case, corporate treasurers, as shown in Figure 2, are building the infrastructure to automate revise the settlement process for the cost and efficiency benefits. The development of value-adding partnerships with partners, offering a wide range of services covering both invoicing and payment services, raises the stakes for inter-organizational information sharing and business flexibility.

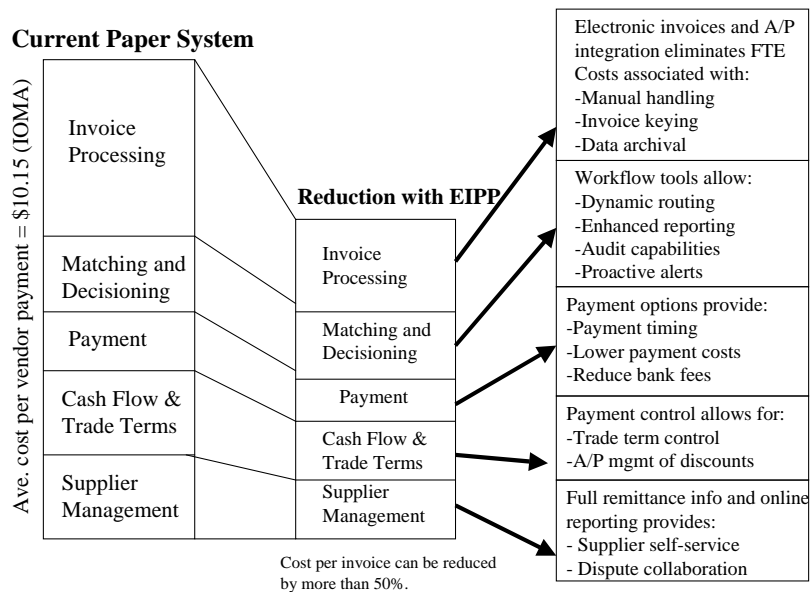


Figure 2. Integration of EIPP into other financial supply chain activities (Proctor & Gamble, 2002)

### 3.2 Trust and Financial Intermediaries

Trust can be seen as the coordinating mechanism which binds the relationship together, provide the necessary flexibility (Buttery and Buttery, 1994; Fukuyama, 1995; Larson, 1992), reduce transaction costs (Reve, 1990; Cummings and Bromiley, 1995; Fukuyama 1995) and reduce the complexity of the relationships. Trust and risk are closely interrelated (Mayer *et al.*, 1995). Zucker (1986) discusses three forms of trust: institutional-based trust that flows from legal and financial systems that feature safeguards against and punishments for malfeasance; process-based trust that flows from past interactions and reputation; and characteristic-based trust that is tied to ethnicity or familial ties, or in this case, to corporate ties to a particular banking institution. On the dyadic level, Uzzi (1999) has demonstrated bankers' practice of developing this type of trust and their heavy reliance on the implicit pressure for conformity to expectations. As the value of financial intermediaries might be disintermediated by these types of EIPP solutions, the issue of trust and risk are important in viewing adoption of these technologies.

### 3.3 IT Integration - EIPP vs. EDI

EIPP can be seen as a package of several key Account Receivable (A/R) and Account Payable (A/P) process improvements:

- Trading Partner Enablement
- Workflow & Collaboration
- Electronic Payment
- Trading Partner Collaboration

Figure 3 shows an overview of the financial logistics that correspond with the physical logistics of the supply chain.

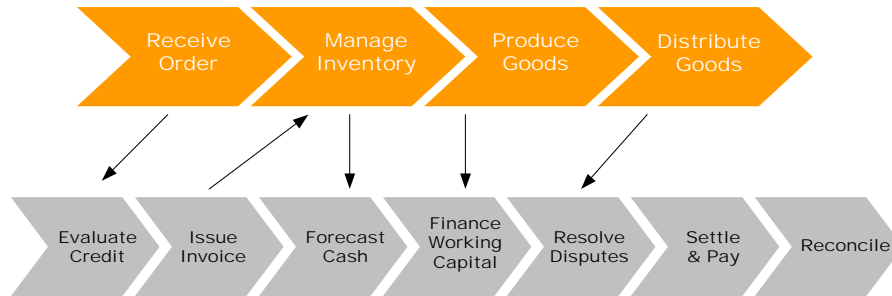


Figure 3. *Financial Supply Chain: parallel financing activities that support the physical supply chain. (Proctor & Gamble, 2002)*

As some might say assume EIPP is really ERP integration or financial EDI, this may create a case for companies to need to partner with others in the financial supply chain to actively take part in EIPP. An innovative application like EIPP can allow new organizational arrangements that can ultimately change the shape of the supply chain (Segev and Gebauer, 2001).

Companies are currently supporting a variety of invoice distribution methods to customers, including paper, EDI, XML, flat-files and customer spreadsheets. They are also supporting new activities as well, such as B2B marketplaces as well as buyer-direct solutions. These companies still process the large majority of invoices and payments in a manual, paper-intensive environment. Manual handling of disputes still occurs, and deductions with limited Information, because no visibility into the process once the invoice has been sent.

Financial Electronic Data Interchange (EDI) provides only a limited solution to electronic payment and, due to the cost involved, remains the exclusive preserve of very large corporates. This is because EDI takes time and effort to create fixed links between established trading partners and its functionality is limited because it does not allow the interactive exchange of data. This means it is not possible, for example, to dispute invoices electronically. And when a large corporate wants a SME to provide a service, the infrastructures are not as tightly coupled and as similarly organized to make it feasible.

Electronic Data Interchange (EDI) provides only a limited solution to this problem and, due to the cost involved, remains the exclusive preserve of very large corporates. This is because EDI takes time and effort to create fixed links between established trading partners and its functionality is limited because it does not allow the interactive exchange of data. This means it is not possible, for example, to dispute invoices electronically. And when a large corporate wants a SME to provide a service, the infrastructures are not as tightly coupled and as similarly organized to make some of the possible EIPP models functional.

### 3.4 Does Size Matter?

EIPP in future will allow suppliers and buyers, regardless of size, to send and receive invoices on-line to their entire customer base in a many-to-many environment. At present, EIPP is still geared more towards the corporate world, aimed to streamline a multiprocess payment system. An EIPP solution can lead to the ability to utilize straight through processing (STP) of clearing, settlement and information reporting as a competitive weapon without the need for corporates to continue to invest in expensive EDI technology.

To achieve a critical mass of invoice transactions, an EIPP solution should be made available to all businesses. Currently, the payment solution offered might be different according to whether the business is a corporate, mid-sized enterprise or small company/sole-trader.

This means the large corporate has to now supplement EDI with paper based invoicing for the many of its customers and suppliers. EIPP will allow suppliers and buyers, regardless of size, to send and receive invoices on-line to their entire customer base in a many-to-many environment. The open standards facilitated by EIPP means that it can be readily integrated into a corporate's existing invoicing and accounting systems without extensive modification to in-house systems. The partners only have to have the necessary customer attributes, as compared to EDI and use of electronic lockbox as shown in Figure 4, to make it desirable to use.

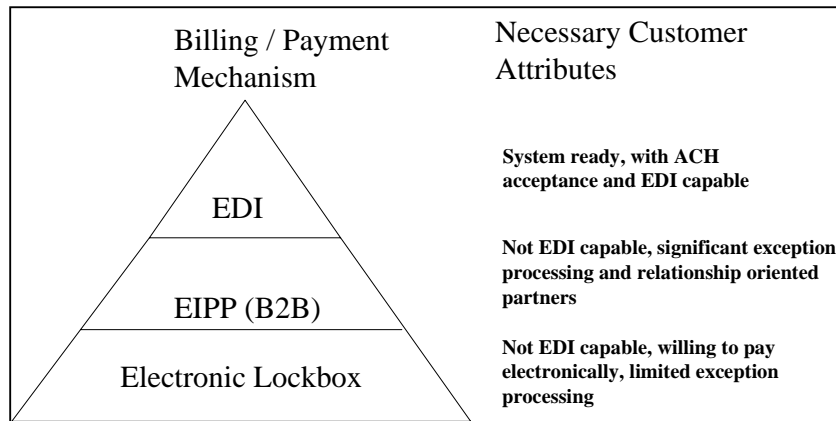


Figure 4. Customer attributes for different payment mechanisms (Proctor & Gamble, 2002).

Even where organizations use electronic funds transfer systems, there are still considerable paper costs involved. And although Automated Clearing House (ACH) technology moves money efficiently, only a small amount of data accompanies each transaction. An EIPP solution will enable the banks to utilize straight through processing (STP) of clearing, settlement and information reporting as a competitive weapon without the need for corporates to continue to invest in expensive EDI technology.

#### 4 EIPP BUSINESS TYPOLOGIES

In understanding the drivers for participation in possible EIPP models, we examine the current three EIPP approaches used in industry today.

##### 4.1 Seller Direct

The seller controls the EIPP application in the Seller Direct model. This model comprises a one-to-many relationship, linking one seller to its multiple buyers for invoice electronic delivery. A seller deploys this model by requesting – or requiring – that its buyers view invoices on the seller EIPP system (NACHA, 2001). It is typically used when a trade relationship already exists between a seller and its buyers, where payment requirements and credit terms have been established. Sellers that implement an EIPP application typically issue a high volume of invoices, or have invoices of high value (NACHA, 2001).

The difficulty with this model is in how a supplier can force its main buyers to accept invoices in the seller's chosen EIPP format(s). Examples of Seller Direct software solutions in industry include: Bottomine, BCE Emergis, eDocs, Checkfree and Avolent.

## 4.2 Buyer Direct

The buyer controls the EIPP application in the Buyer Direct model. This model comprises a one-to-many relationship – with one buyer providing an interface for many sellers. A buyer deploys this model by requesting – or requiring – that its sellers post invoices to the buyer EIPP system (NACHA, 2001).

This model is mainly for buyers whose purchasing patterns result in a large number of invoices.. This is an emerging model, with a requirement of adequate volume of invoices for buyer start-up to create somewhat of a barrier to adoption.

Buyer centric models will be key to the successful deployment of EIPP regardless of whether the technology is made available by the buyer itself i.e. buyer-direct or through an external ‘consolidator’ solution i.e. hosted on behalf of the buyer. Examples of Buyer Direct software solutions in industry include: iPayables and Direct Commerce.

## 4.3 Consolidator

The consolidator controls the EIPP application in the Consolidator model. This model comprises a many-to-many relationship – providing an interface between multiple sellers and buyers. Consolidators are generally third parties and may provide, directly or through partners, a variety of additional financial services such as factoring, escrow, insurance, credit ratings and payment processing (NACHA, 2001). Examples of Consolidator software solutions in industry include: Xign eDocs, and BillingZone.

## 4.4 Adoption of EIPP by Geography

At present, given the level of partnership needed and the complexity, only three countries have widespread EIPP bank offerings (US, Canada, Australia), with other smaller implementations taking place in places like Switzerland, New Zealand, the Scandinavian countries, Hong Kong and the United Kingdom. Logica has helped Norwegian company, Bankenes Betalingssentral (BBS), develop a unique national consolidator system to provide an e-invoicing product called e-faktura on behalf of the five largest Norwegian banks to a range of billing companies including utilities and telcos (Fairchild, 2003b). Banks involved into the EIPP market have referral or reseller relationships with software or service providers, playing the role of biller service provider (BSP) to their corporate customers (Fairchild, 2003a). This BSP role for banks is important in bringing the EIPP market to maturity and encouraging its natural relationship with the other corporate-oriented services offered by banks.

Given our initial statement regarding the convergence of cash management solution for banks and for corporates, how has EIPP adoption for corporates occurred in the market? We next discuss a recent industry survey for treasurers to examine EIPP adoption and dissemination.

# 5 EIPP CORPORATE ADOPTION SURVEY RESULTS

## 5.1 Overview of GTNews survey and Acknowledgements

In May 2003, GTNews, a treasury industry journal, carried out an online survey with 231 respondents, asking corporate readers about their cash forecasting and cash-to-collections process and their use of electronic invoice presentment and payment techniques.

The author would like to acknowledge and thank GTNews for the use of this survey material. GTNews - www.gtnews.com - ©2003.

## 5.2 Key Reasons for Implementing EIPP

As shown in Figure 5, 39 percent of respondents who implemented an e-invoicing solution gave streamlining A/R and A/P processes as the most important factor. 21 percent mentioned the process could considerably reduce costs. A similar amount acknowledged the improvement in working capital and reduction in DSO e-invoicing delivers.

Just under a fifth (18 percent) of respondents claimed adherence to customer demand in implementing the service, in that e-invoicing helped improve the customer's experience.

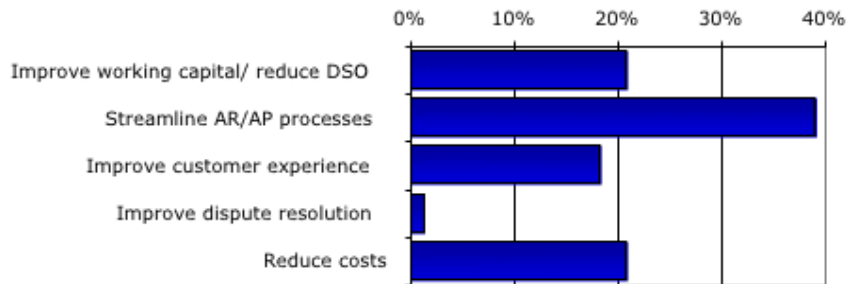


Figure 5. Reasons for implementing electronic invoicing. GTNews - [www.gtnews.com](http://www.gtnews.com) - ©2003.

## 5.3 Benefits Experienced

Benefits experienced by survey participants were in line with expectations across a range of key benefits. But as shown in Figure 6, in process efficiency and customer service, more than 30 percent experienced a difference. 37 percent of respondents who have implemented an e-invoicing solution felt benefits to their process efficiency were better than they expected, while 32 percent felt improvement with the impact on customer service. A further 25 percent said improvements in DSO had exceeded expectations.

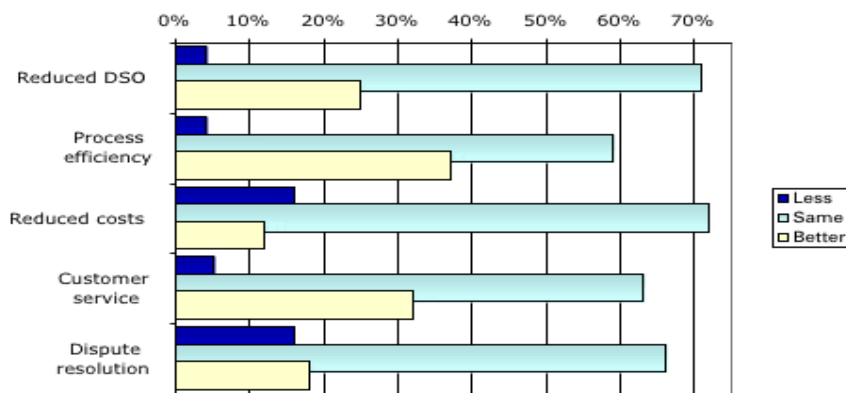


Figure 6. Benefits experienced by corporates since implementing an e-invoicing solution. GTNews - [www.gtnews.com](http://www.gtnews.com) - ©2003.

A limited budget or lack of internal sponsorship has proven to be the biggest hindrances to the implementation of e-invoicing solutions, as shown in Figure 7. Twenty five percent of respondents who considered but rejected e-invoicing cited these as the key factors in their failure to adopt the technology. This is understandable in the present economic climate and hints at considerable growth in usage when the economy begins to regain its footing.

The 14 percent of respondents who believed that their existing processes were inadequate to handle the transition to electronic invoicing may find that in future customer demand may make them address these problem areas.

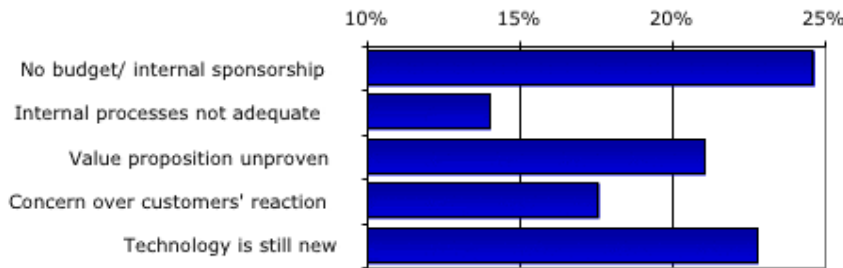


Figure 7. *Reasons for not going ahead with an e-invoicing implementation. GTNews - www.gtnews.com - ©2003.*

#### 5.4 Uptake in e-Invoicing

The scope for a significant increase in the uptake of e-invoicing in the next 12 months is reflected in the survey from the plans of current non-users. Of those firms still not employing electronic invoicing, just under a third (32 percent) said they had no plans to reconsider the solution in the near to mid-term.

Of those companies who have never considered electronic invoicing, around half (52 percent) have no plans to consider e-invoicing in the next two years. Nevertheless, 35 percent expect to at least consider electronic invoicing as an option at some point in the next 12 months. Combined with those who have rejected e-invoicing in the past, the total percentage of non-users expecting to consider e-invoicing in the next 12 months stands at 45 percent - a clear indication that market acceptance is on the rise.

## 6 ANALYSIS

EIPP value to the corporates from the survey are centered on process streamlining and cost. Longer term benefits, such as customer experience enhancement, appeared not be the initial drivers. But some companies from the survey (18 percent) remain concerned about their customers' reaction. This may be a barrier when dealing with smaller, less well-resourced trading partners.

Maturity of solution, for both banks and corporates, appears to be one of the issues for implementation. Examining growth opportunities from the survey, 34 percent were planning to review the possibility of implementation in the next 6 months, suggesting that a 'wait-and-see' policy is at work. A further 27 percent expected to consider implementing e-invoicing in the next 12 months. (Just 7 percent were prepared to wait up to two years before reconsidering their options.)

Although there is interest, EIPP still needs to catch on as a corporate process change. Just under half (49 percent) had less than a quarter of their revenues were processed via electronic means. Only 8 percent of respondents received between 51 percent and 75 percent of their receivables via electronic invoice presentment and payment. But 21 percent of respondents said above 75 percent of their receivables were processed in an EIPP environment; a possible sign the technology is gaining ground with experienced users.

## 7 CONCLUSIONS AND FUTURE DIRECTIONS

The findings of this paper suggest that EIPP opportunities for corporations will be differentiating payment mechanisms with services based around the infrastructure components. There are many other

ways to realize financial supply chain efficiencies from EIPP, for example in taking better advantage of the trade discount.

Current industry models show dominant buyers tend to require integration with their existing enterprise systems, including those for supply chain management and accounts payable. Conversely, in industries where the sellers hold power relative to buyers the value of EIPP revolves around dispute resolution, purchase approval and workflow capabilities. Given the drivers from the survey focus on both cost and process streamlining, corporate buyers appear to be the dominant force at present in the market.

Directions for future research include additional case study research to further examine the value proposition and to create a definitive list of success factors of EIPP implementations once the installed base of EIPP is larger.

## References

- Benston, G., & Smith, C. W. (1976). "A Transactions Cost Approach to the Theory of Financial Intermediation". *Journal of Finance*, 31: p. 215-231.
- Buenger, V., Daft, R. L., Conlon, E. J., & Austin, J. (1996). Competing values in organizations: contextual influences and structural consequences, *Organization Science*, Vol. 7, No. 5, pp. 557-576.
- Buttery, E. and Buttery A. (1994). *Business Networks: Reaching new markets with low cost strategies*, Longman Business and Professional, Melbourne: Australia.
- Cummings, L.L. and Bromiley, P. (1996). "The Organizational Trust Inventory (OTI): Development and Validation". In R.M. Kramer and T. Tyler (Eds.), *Trust in organizations*. pp. 68-89, Newbury Park: Sage.
- Economides, N. (1996). "The Economics of Networks". *International Journal of Industrial Organization*, 14: p.673-699.
- Erario, R. (2003). "Making the Business Case for EIPP". White Paper - JP Morgan Treasury Services. Available as of November 11, 2003 at:  
<http://ts.jpmorgan.com/cm/cs?pagename=Chase/Href&ArtName=jpmorgan/cash/a/EIPP>
- Fairchild, A.M. (2003a). "Possible Disintermediation: What Role for Banks in Electronic Invoicing (EIPP)?" Proceedings of the 16<sup>th</sup> Bled Electronic Commerce conference, June 9- 11, 2003.
- Fairchild, A.M. (2003b). Value chain positions for financial institutions in Electronic Bill Presentment and Payment (EBPP). In Sprague, R. (Ed.), *Proceedings of the 36th HICSS*. P. 196. Los Alamitos, CA: IEEE Computer Society.
- Fairchild, A.M and Peterson, R.R. (2002) "Theoretical and Empirical Analysis of Collaborative Commerce in Financial Services: The Case of e-Settlement Solutions", Chapter in: "Information Systems. Academic and Executive Global Alliances" eds. M. Gordon Hunter and Kathy Dhanda.
- Fukuyama, F. (1995) *Trust: the social virtue and creation of prosperity*, Free Press: New York.
- GartnerGroup (2001). B2B Internet Invoicing & Payments: Cash is King , GartnerGroup report, Jan 2001, Stamford, CT.
- GTNews (2003). "Working Capital Survey: Electronic Invoice Presentment & Payment". Available online at URL: <http://www.gtnews.com>.
- Larson, A. (1992) "Network Dyads in Entrepreneurial Settings: A study of the governance of exchange relationship", *Administrative Science Quarterly*, Vol. 37, p. 76-104.
- Mayer, R. J., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20, 709-734.
- NACHA (2001). "Business-to-Business EIPP: Presentment Models, Part 1", The Council for Electronic Billing and Payment, National Automated Clearing House Association publication (NACHA).
- Proctor and Gamble (2002). Web Technology for Business Benefit: Myth or Reality? The Procter and Gamble Corporation Experience. The AFP 23rd Annual Conference. November 5, 2002

- Reve, T. (1990) "The firm as a nexus of internal and external contracts". In Aoki, M. Gustafson, B. and Williamson, O. (Eds) *As a Nexus The Firm of Treaties*, pp. 133-161, Newbury Park: Sage.
- Segev, A. and Gebauer, J. (2001). "Changing Shapes of Supply Chains - How the Internet Could Lead to a More Integrated Procurement Function," *Supply Chain Forum*, Vol. 2, No. 1 pp. 2-9
- Stabell C. B., & Fjeldstad, Ø. D. (1998). "Configuring value for competitive advantage: On chains, shops, and networks", *Strategic Management Journal*, 19: p. 413-437.
- Uzzi, B. (1999). "Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing". *American Sociological Review*, 64: 481-505.
- Young, G. (2002). "Logica Payment Solutions White Paper; EIPP for Financial Services", Logica plc, London, UK.
- Zucker, L.G. (1986) The production of trust: Institutional sources of economic structure. In B.M. Straw and L.L. Cummings (Eds.) *Research in Organizational Behavior*, Vol. 8: p. 55-111, Greenwich, CT: JAI Press.