# *e-Business Messaging Interchange Assessment*

White Paper

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## Table of Contents

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## *1 Introduction*

Today's medium to large enterprises face a bewildering array of interchange format and mechanism choices. This document attempts to provide analysis tools that can help decipher the optimum choices for a given set of business needs. To achieve this goal, it is necessary to assess typical current interchange needs, and then compare those against the technologies available today.

Since everyone's business needs vary depending on their own circumstances, the focus here is on providing the means to understand the technology capabilities and then giving guidelines on how those relate to solving typical business needs. Obviously the optimum business solution is to purchase just the right amount of technology to solve the given business requirements.

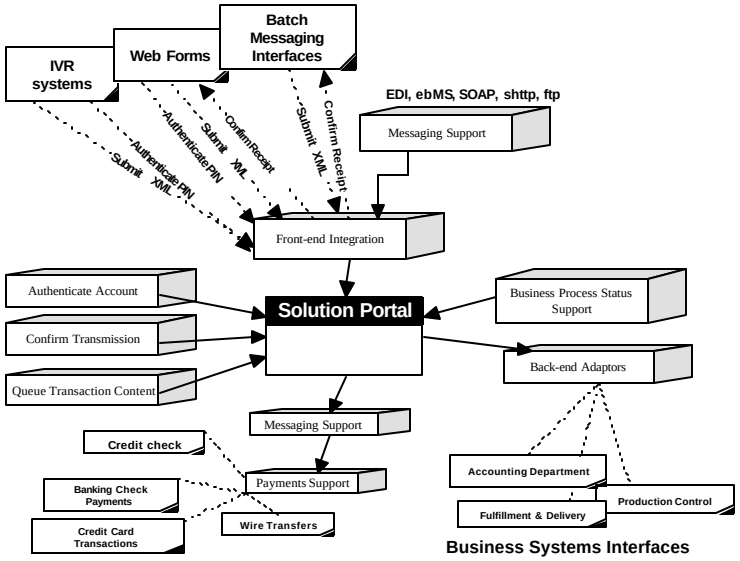
Of course the optimal technology strategy when you need to support multiple different interchange systems would be to engineer and architect so that the particular formatting and messaging exchange mechanisms are abstracted through a common interface mechanism that supports the functional needs (such as security, authentication, encryption, delivery confirmation, and envelope routing). This approach greatly reduces the maintenance and support overhead while making it much simpler for the e-Business environments to support different and new interchange interfaces in the future. While this sounds simple, in practice this requires sophisticated understanding of the underlying configurations required and standards used. In the past marketplaces tried to enforce use of just a single standard across all participants to keep connections simple and to lock participants into that marketplace.

Technology developments, particular the emerging universal support for XML based content structures and Internet messaging protocols are fundamentally reducing the challenges in implementing a common interface approach. Figure 1 shows conceptually how such a common interface may be configured that can manage both legacy and XML based interchanges and integrate them into the overall business management systems.

While at first glance systems may appear to be physically different, such as a telephone interactive voice response submission (IVR) compared to an internet web page or an EDI VAN messaging interface, fundamentally they all share the same interchange characteristics and therefore can be mapped onto a common interface mechanism.

However such a comprehensive system is often above and beyond the typical implementation budget of a medium sized enterprise, or of typical downstream supply chain participants seeking a simpler point solution.

**Figure 1 – Illustrative Enterprise e-Business Interface Components**




As mentioned before the alternate approach is to simply select some simple business process tracking software plus a default communications mechanism that the majority of participants can acquire so that they can create a business exchange system between themselves. Therefore that technology should support widely available existing software as that reduces the barrier for integration with trading partner systems that need to acquire and implement them. Similarly government departments need to support a wide array of broadly available communications means with industry and citizens, while at the same time meeting basic requirements of secure and authenticated communications.

This report looks at appropriate factors in making such business determinations of the most common denominators between trading partners and provides a cross-tabulation according to the appropriate communications technologies. The combined result of these should be a simple and effective set of solutions that are affordable for businesses and individuals to utilize for their e-Business needs today. Into the future these parameters also provide metrics to assess emerging technologies, for example PDA and cell-phone based text-messaging exchanges as options to providing business connectivity.

We hope you find this analysis useful in managing and acquiring your own e-Business solutions.

From: The OASIS/CEFACT JMT Team.

## *2 Business Assumptions*

In formulating the technology analysis we have assumed a set of business requirements focused around augmenting existing technologies rather than a total replacement strategy. While FAX continues to dominate as the means of electronically exchanging paper-based information, newer technologies such as e-mail, web-based forms and interactive voice response (IVR) systems are all now providing enhanced capabilities for delivering business solutions. Particularly in today's world of security consciousness, but also facing a rapidly growing technology-aware society, the need to provide better authenticated, secure and tamper proof delivery mechanisms is making older systems such as FAX outdated. Therefore we have chosen a set of technology evaluation criteria that reflect the needs to deliver secure communications. These criteria provide the underpinning to deliver business level functionality such as:

- Verification that my order or invoice was received
- Capability to understand whom I am transacting with
- Confidence that the message received is what my trading partner sent
- Lower maintenance costs due to adequate error handling
- More control over deployment costs with certified interoperable software components

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We have also selected a base set of communications systems so we briefly describe each of those here:

### FAX based system

This is a FAX server system that has ability to scan incoming FAX transmissions electronically and to control the dial-in and delivery process. This includes the ability to force a sender to use a PIN number to authenticate themselves, and also to verify and log the telephone number being used by the sender to transmit the FAX from.

### Dial-in IVR

An interactive voice response system with menu driven capabilities and the ability to control a telephone switch system. The server can request a PIN and account details to verify access, and then produce an electronic transaction file reflecting the user's menu choices.

### EDI VAN (sftp)

This is the traditional full-service VAN (value added network) provider that manages delivery and transmission of EDI (electronic data interchange) messages across secure networks and dial-up connections. These services are in-place today supporting the EDI systems worldwide. They use secure file transfer protocol (sftp) as the preferred means of ensuring reliable delivery of messages across their networks.

### AS2 EDIINT

This is a standard for delivering EDI messages across the Internet using http exchanges based on the earlier AS1 work. Begun in late 1999, AS2 was developed by members of the EDI standards community to allow them to take advantage of the Internet as a delivery mechanism (EDIINT). The standard is therefore heavily based on earlier EDI mechanisms and delivery of EDI style payloads. While a solid and adequate implementation for that environment it lacks the full sophistication of the newer XML based messaging solutions. Several vendors have developed interoperable products that use AS2 messaging that are intended for use with these EDI systems or with an XML payload.

### Email

Using SMTP (Simple Mail Transfer Protocol) based servers for delivery of electronic mail (email) messages. Optionally this can include the use of digital signatures, certificates and encryption to enhance the security of the information exchanged. However not all email client software is configured to support these features. By configuring an SMTP server, receipt and delivery can be automated and integrated into users' applications systems.

### Dial-in modem

This is the traditional BBS (bulletin-board service) style interaction. The BBS controls access through accounts and passwords and uses standard dial-up modem technology to secure the exchange of information, including encryption that the modem hardware and software provides. Typically users upload text files to the BBS and download any pending messages to their own systems. Messages could use XML formats, and delivery recovery and restart along with encrypting modems are all supported today.

### Web Pages

The use of a web browser forms based system and shttp (secure hypertext transmission protocol) to provide authentication and validation of access. This is also supplemented with firewall and IP (Internet Protocol) address tracking mechanisms to reduce the risk of fraud or tampering with transmissions between the web client systems and the web server providing the forms interfacing. Again account numbers and passwords are used to authenticate users and manage access.

### SOAP

Simply Object Access Protocol (SOAP), the equivalent of traditional web based RPC (remote procedure call) style server-to-server exchanges, uses XML as the control syntax and message formats via the Internet. The security layer is provided by shttp mechanisms and firewall and IP address tracking as with web page use. This category assumes a simple standalone SOAP server that does not include any extensions to support other XML syntax mechanisms that trading partners may not also support. Essentially

this is the batch equivalent of the web-based form interfacing. The Apache project provides an open SOAP server software implementation that has been widely deployed and is freely available. Microsoft also has SOAP tools and downloads available for their development environments and .NET. The original work on SOAP was donated to the W3C (World Wide Web Consortium) who now manage the specifications work (http://www.w3c.org/2000/xp/Group/). Products may embed the SOAP server into their deployed software components.

## ebMS

Products based on the latest derivative of the ebXML Messaging standards provided by OASIS (Organization for the Advancement of Structured Information Standards) [http://www.oasis-open.org]. Over a dozen vendors are now providing solutions that support ebMS and many of them have been independently certified as interoperable (see: http://ebusinessready.org/ebxml.html ) . The ebMS approach provides a comprehensive system of exchanging documents and managing business processes using XML based messaging securely via the Internet. It also supports the use of binary file exchanges and sophisticated routing, delivery and error recovery mechanisms. A team of communications technology experts designed ebMS over more than three years as part of the joint UN/CEFACT (United Nations/Centre for Trade Facilitation and Electronic Business) and OASIS work on the open and public ebXML standards for eBusiness over the Internet. Servers supporting ebMS therefore exploit state-of-the-art XML and Internet communications techniques along with firewall and IP addresses and ports to control delivery and services.

The next section now outlines the underpinning technology capabilities for each of these delivery systems and evaluates their effectiveness.

In addition to the base set of communications solutions selected here there are others that could be considered such as RosettaNet messaging, and then non-internet based solutions such as FIX and SWIFT messaging. However, our criterion for technology inclusion was to concentrate on horizontal solutions that span industry sectors. Those considered are typically deployed on open networks (i.e., Internet or telephone dial-up connections) and are based on approved public specifications.

## *3 Communications Technology Factors*

The table here shows a basic set of communication interchange needs that would be required for a typical e-Business system that meets normal business operational and legal requirements.

**Table 3.1 – Communication interchange features.**

| Capability | Examples | Purpose |
|---|---|---|
| Authentication/access control | PIN codes, firewalls, dedicated lines. | Ensure content is received from known sender. |
| Robust delivery protocol support | TCP/IP, SNA, SMIME | Guarantee bytes transmitted are also received exactly as sent. |
| Delivery failure recovery | EDI VAN, registered paper mail, FAXES. | Will continue to attempt to re-send, will recover from most recognized delivery system failures. |
| Packaging control | Format description:- EDI ISA segments, internet MIMETYPE system. | Sender can instruct the receiver as to the start and end of content, and the sections within the transaction. |
| Message Structure validation | DTD, Schema, EDI ISA segment control standards | Agreement between sender and receiver as to physical interchange format required. |
| Envelope validation | EDI ISA segments, email SMTP routing, ebMS CPA structures. | Ensure that the sender is recognized by the receiver and that the sender is authorized to submit that type of content |
| Signature support | XML digital signature, email SMTP certificates | Additional security checks to validate sender and also legally endorse the interchange. |
| Encryption support on envelope | SMIME (for SOAP based connection model) | Prevent eavesdropping gaining access to communications details between two parties. |
| Encryption support on payload | RSA encryption, PGP encryption (for SOAP based connection model) | Prevent unauthorized access to content. |
| Payload structure validation | DTD, Schema, EDI ST segment control standards. | Agreement between sender and receiver as to physical content required. |
| Routing support | SMTP routing, Internet DNS routing, EDI VAN delivery rules. | Allow content to reach the desired recipient based not on just physical addressing, but also deferred delivery via third party, or broadcasting to multiple recipients, or passing to correct backend application(s). |
| Receipt confirmation | Confirmation code value sent, acknowledgement that a successful delivery occurred without any messaging errors. | Transaction number created, EDI 997 ACK message, email delivery receipt confirmation. |
| Backend application control | EDI error codes, business error messages, printed paper problem reports. | If errors occur post-delivery, that these can be communicated accurately from the processing system(s) back to the original sender. |

| Capability | Examples | Purpose |
|---|---|---|
| Activity tracking | Transmission logs and queue archives | Allow auditing of exact interactions and verification of delivery and payloads interchanged. |

These interchange needs can then be compared to the various messaging technologies in use today and table 3.2 shows this summary analysis.

Additionally table 3.3 contains a set of features that reflect the availability and quality of the solutions also. These factors capture the suitability-to-task for each technology compared to the needs of typical business requirements, not just communications aspects. These factors have been chosen based on today's challenging real-world demands and the needs for robust solutions.

## Scoring System

Rather than just provide a simple Yes/No evaluation it was felt important to assign a weighted score from 1 to 10, where 10 is the best score, which reflects on how well the particular technology delivers on the functionality being evaluated. For instance while a FAX system may provide a PIN access security code and tracking of telephone dial-in numbers this is reasonably easy to compromise. Whereas use of digital certificates and digital signatures with XML based messaging provides a much more robust access security. Therefore the scores reflect the relative strengths and abilities of each technology when compared to each other and the specific functionality. Again it should be noted that the technology configurations conform to the overall descriptions listed in the Business Assumptions section above and correspond to typical products available in the marketplace today. While obviously some of these assessment results could be subjective, overall the intention here is to provide a typical profile of the each technology's strengths and weaknesses. These results could form the basis of more detailed analysis as necessary for a specific business implementation.

Those items highlighted in light-green in table 3.2 indicate items that are best-in-category results.

**Table 3.2 – Technology features and properties**

| Capability | FAX | Dial-in IVR | EDI VAN (sftp) | AS2 EDIINT | Email | Dial-in modem | Web Pages | SOAP only | ebMS |
|---|---|---|---|---|---|---|---|---|---|
| Authentication/ access control | Dialers # printed on FAX | PIN required from user | Account passwords and access ports | Account passwords and access ports | Limited ability to trace sender | PIN / account validation, dialers # | PIN / account validation | Access port address | Account passwords and access ports |
| *score* | 6 | 5 | 8 | 8 | 4 | 6 | 6 | 5 | 8 |

| **Capability** | **FAX** | **Dial-in IVR** | **EDI VAN (sftp)** | **AS2 EDIINT** | **Email** | **Dial-in modem** | **Web Pages** | **SOAP only** | **ebMS** |
|---|---|---|---|---|---|---|---|---|---|
| Robust delivery protocol | FAX-3 checks delivery | Directed Menu, call restarts if not complete | Dedicated transmission lines with sftp | Internet delivery via TCP/IP | SMTP and TCP/IP | Modem protocols | TCP/IP | TCP/IP | TCP/IP or SMTP. |
| *score* | 7 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 |
| Delivery failure recovery | Re-dial, re-send | Re-dial | Re-send | Real-time delivery | Manual diagnostic required | Manual post-check required | Manual post-check required | Real-time delivery | Reliable messaging |
| *score* | 7 | 5 | 9 | 5 | 3 | 3 | 3 | 5 | 9 |
| Packaging control | None | Menus | EDI segments | EDI segments | Attachments | Limited | Pages | XML based | XML, MIME + attachments |
| *score* | 0 | 5 | 8 | 8 | 6 | 6 | 6 | 8 | 9 |
| Message Structure | Pre-printed forms | Menus | EDI structure, and XML | EDI structure, and XML | XML or similar payload | Limited | XML server-side output | XML + DTD / Schema | XML + business templates, and EDI |
| *score* | 5 | 5 | 8 | 8 | 5 | 5 | 9 | 8 | 9 |
| Envelope validation | PIN code control | PIN code control | Limited control, rely on backend tests | Limited control | Junk mail scanning | Limited control | Software control | Limited control via UDDI | Full validation with CPA |
| *score* | 2 | 2 | 5 | 5 | 5 | 5 | 6 | 7 | 9 |
| Signature support | Act of sending | Using menus | Certificate support | Certificate support | Certificate support | Act of sending | Accept button | None | XML Certificate support |
| *score* | 0 | 0 | 8 | 8 | 8 | 0 | 0 | 0 | 9 |
| Encryption support on envelope | N/A | N/A | None | None | None | None | None | None | Yes |
| Encryption support on payload | During transmission | None | Yes | Yes | Some | During transmission | SSL transmission | SSL transmission | Yes |
| *score* | 5 | 0 | 8 | 8 | 6 | 6 | 7 | 7 | 9 |
| Payload structure validation | None | Server-side output | EDI mapping rules | EDI mapping rules | Limited | Limited | Web form checks | DTD or Schema | DTD or Schema |
| *score* | 0 | 7 | 8 | 8 | 5 | 5 | 9 | 7 | 7 |
| Routing support, with tracking and interfacing across delivery networks and communications protocols | Broadcast server | None | Extensive rule based in-house mechanisms and gateways | Real-time point to point | Lists and rule based forwarding, but can be spoofed. | Point to point | Backend server based | Point to point | Yes; open mechanisms driven by XML envelopes and profiles |
| *score* | 7 | 0 | 9 | 0 | 8 | 0 | 5 | 0 | 8 |

| **Capability** | **FAX** | **Dial-in IVR** | **EDI VAN (sftp)** | **AS2 EDIINT** | **Email** | **Dial-in modem** | **Web Pages** | **SOAP only** | **ebMS** |
|---|---|---|---|---|---|---|---|---|---|
| Receipt confirmation | Basic | Confirmation code | Yes | Yes | Optional | Optional | Form display possible | No | Yes |
| *score* | 5 | 5 | 9 | 9 | 7 | 7 | 7 | 0 | 9 |
| Backend application control | None | Limited | Mapping tools + 997 | Some real-time | Limited | Limited | Some real-time | No | XML mapping + ACK |
| *score* | 0 | 7 | 8 | 7 | 5 | 5 | 7 | 0 | 8 |
| Total Score | 44 | 49 | 97 | 82 | 71 | 56 | 73 | 55 | 101 |

The total scores in table 3.2 reflect a weighted value that provides a comparative result for the technologies as a whole compared to the best fit for typical robust e-Business mission needs.

The next table shows factors related to the overall business requirements, rather than the pure technology provided. These business factors include the ability of the technology to support and foster a large and open usage base, which is a critical success factor in terms of ensuring widespread adoption and implementation within a particular industry deployment itself. The combined result of these should be a simple and effective set of solutions that are affordable for businesses and individuals to utilize for their e-Business needs.

**Table 3.3 – Availability and suitability factors**

| **Capability** | **FAX** | **Dial-in IVR** | **EDI VAN (sftp)** | **AS2 EDIINT** | **Email** | **Dial-in modem** | **Web Pages** | **SOAP** | **ebMS** |
|---|---|---|---|---|---|---|---|---|---|
| Robust delivery with - proven / independently certified - interoperable solutions | Yes, FAX group 3, but delivery controls weak | Can create XML formats; telephone interfaces error prone | Yes | Yes, but real time model limits robustness | Yes, but error recovery weak and delivery unspecific. | Can deliver text and XML formats, proprietary connections /delivery | Yes (W3C test suite) | Most widely used source thru Apache project and .NET tools; limited error recovery | Yes (IIC test suite and conformance tests available)[1] |
| *Score* | 7 | 5 | 9 | 8 | 4 | 6 | 6 | 6 | 9 |
| Open source and very low cost tools available | Yes | Low cost tools | Some limited open source | No open source, some low cost tools | Yes | Yes | Yes | Apache project, and Microsoft .NET | Yes. |
| *Score* | 9 | 8 | 8 | 6 | 9 | 9 | 9 | 9 | 9 |

[1] ebXML IIC Test Framework (Conformance and Interoperability) and Basic Interoperability Profile for ebMS (Interoperability only). The OAG-NIST Test Bed; focused on interoperability - is using the IIC framework. And KorBIT/Asian ITG: focused on interoperability - will also use IIC framework– and may lead to formalized certification testing there too.

| **Capability** | **FAX** | **Dial-in IVR** | **EDI VAN (sftp)** | **AS2 EDIINT** | **Email** | **Dial-in modem** | **Web Pages** | **SOAP** | **ebMS** |
|---|---|---|---|---|---|---|---|---|---|
| Completeness of information gathered | Weak validation and format checking | Menu driven limits data content | Post Validation supported | Post Validation supported | Supports text content but weak error support | Supports text content but weak error support | Yes But form edits may restrict options for entry | XML validation, but weak post validation support | XML validation and post validation supported |
| *Score* | 3 | 5 | 8 | 8 | 6 | 6 | 8 | 7 | 8 |
| Flexibility and ease of integration / maintenance | Requires careful form design for best results | Menu system hard to re-configure | EDI formats rigid but XML more open. Formal message exchange limiting | EDI formats rigid but XML more open. Formal message exchange easier | Message exchange easy to configure, control of content weaker | Message exchange easy to configure, text message formats limit changes | Online forms easy to change, but require more support | XML messaging simpler to configure and XML content easier to maintain, but self-maintenance needed | XML messaging more formal to configure, but XML content easier to maintain |
| *Score* | 3 | 4 | 6 | 7 | 7 | 7 | 8 | 8 | 8 |
| Accessibility support (508) | Indirectly or with Braille forms | Yes | N/A | N/A | Yes | N/A | Yes | N/A | N/A |
| *Score* | 7 | 9 | 5 | 5 | 8 | 5 | 8 | 5 | 5 |
| Activity tracking and audit verification | Digital Archive of physical FAX received and sender | Archive of completed interchanges | Archive of transactions and log entries with envelope, + secure storage | Archive of transactions and log entries with session | Archive of messages and envelope | Archive of messages and account access | Archive of transaction and PIN account access | Archive of transaction and log of session details | Archive of transactions and log entries with envelope |
| *Score* | 7 | 7 | 9 | 8 | 7 | 7 | 7 | 7 | 8 |
| *Total Score* | 36 | 40 | 45 | 44 | 41 | 40 | 46 | 42 | 47 |

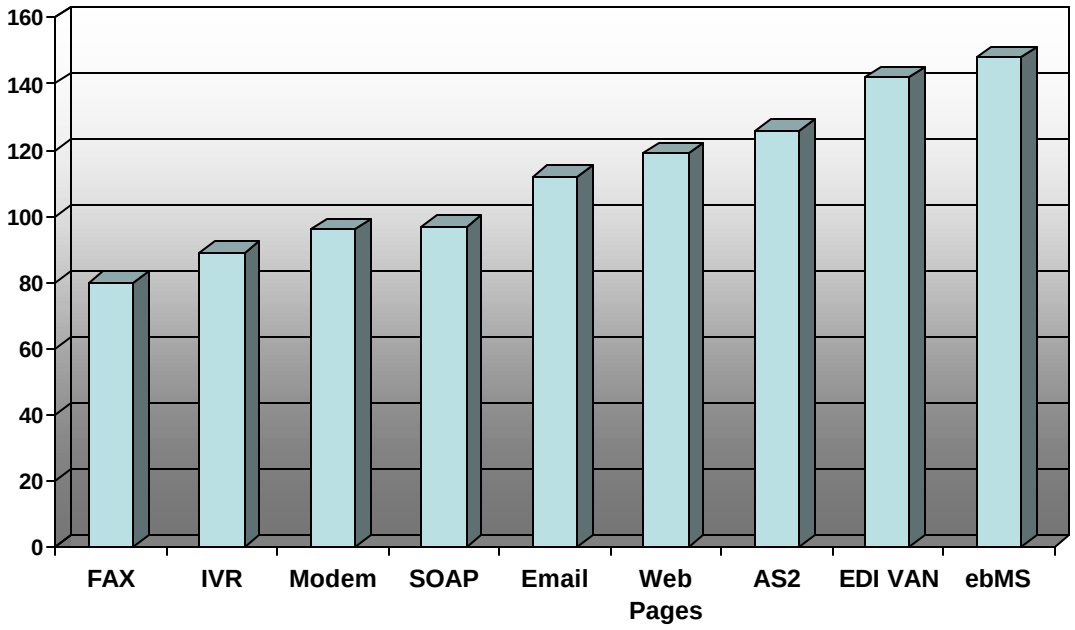
The total scores in table 3.3 reflect a weighted value that provides a comparative result for each technology with regards to the business needs. Those with the higher score should be emphasized in any solution architecture as offering the preferred long-term business capabilities and suitability.

## *4 Analysis Summary*

Figure 4.1 reflects a combined value of both business capabilities with technology soundness. While it should be noted that each technology has certain strengths and weaknesses, those with the highest technology soundness represent reduced risk both in terms of audit validation, long-term applicability to task and also compromising of the underlying systems. Each factor has been scored equally; therefore the total value reflects this. However each factor could be additionally weighted as to the overall importance to delivering mission requirements.

This additional level of granularity is left as an exercise for the reader to tailor to specific individual mission characteristics, while the raw numbers sufficiently reflect the overall needs based on the specific factors chosen and evaluated. Overall the scores obtained matched well to the existing deployment experience with the current technologies.

**Figure 4.1 - Relative value and suitability to task for e-Business solutions.**




The figure shows the available technologies arranged from lowest to highest.

Often in building as large a community of e-Business users as possible the combined use of a selection of these delivery methods is appropriate. The final analysis should therefore include a matrix of business cost-benefit. It is suggested that the following categories are useful in making these determinations:

- Development and Planning: includes personnel and other costs associated with the studies, planning, documentation, and analysis required for the project, along with any personnel, hardware and software necessary for a testing environment of new systems or applications

- Acquisition and Implementation: includes the acquisition of the actual project hardware and software, as well as the personnel required to accomplish and complete implementation

- Maintenance and Operations: includes upgrades, maintenance, and recurring training

Further help and assistance in implementation planning can be found through various online support groups such as through the ebXML development site, http://www.ebxml.org, and also the XML/edi Group, http://www.xmledi-group.org/ .

## *Addendum - Glossary of Technologies*

**Table A.1 – Communication technologies**

| Technology | Description / Configuration |
|---|---|
| FAX | Digital FAX system with OCR, pre-printed forms and optical storage server. Optional security via PIN code entry and verification. |
| IVR | Telephone Interactive Voice System, voice controlled menus, control server with ability to output session results as XML transaction, and to query backend application databases to verify user inputs and selections. |
| EDI | Traditional EDI VAN services with ability to manage EDI and XML transaction formats. Dedicated communications lines and secure access connections via VPN. Sophisticated tracking, encryption and verification with queuing and transaction mapping. Secure FTP based message interchanges. |
| AS2 | Real-time EDI system via internet using EDIINT standards protocol. Includes similar services to traditional VAN, but via internet delivery. |
| Email | SMTP server with ability to deliver text or XML transactions via email delivery. Application queue allows transactions to be processed by backend systems. |
| Modem | Traditional dial-up delivery system, where user has access account, connects to the server and uploads text or XML transactions via telephone line connection. Simple interchange requiring user to connect to upload content and receive any responding transactions in return. |
| Web Pages | Form based interfacing using HTML based web browser forms. Backend server creates XML transactions from HTML input in web browser. Validation checks both at the client and also server side checks for valid form entries. |
| SOAP | XML based internet messaging system developed by the W3C. Uses lightweight interchange protocol. Free software available via Apache project, and also Microsoft website. Requires developers to enhance base system with message queues and other components to provide robust messaging platform. |

| Technology | Description / Configuration |
|---|---|
| ebMS | XML based internet messaging using SOAP plus binary attachments, enhances simple SOAP exchanges into fully secure messaging solution. Sophisticated message technology developed over three years by joint CEFACT/OASIS ebXML standards efforts. Intended as next-generation business-to-business integration messaging. |

## *Related Studies and Information*

In compiling this document regional resources were identified that could be helpful for making informed decisions, particularly giving people locale and special circumstances details, and particularly where these organizations have informed and strong knowledge of e-Business messaging deployments through their membership participation. We provide a list here of such organizations and where applicable links to specific documents. This is a list and not an endorsement, nor is it intended to be definitive and exhaustive. As we become aware of other resources we will provide updates and extensions to our current document.

**North America**

DISA (for EDI and XML standards) – http://www.disa.org
XML/edi Group – http://www.xmledi_group.org
ebXML.org – http://www.ebxml.org
ebXML Developers list – ebxml-dev@lists.ebxml.org
Open Applications Group - www.openapplications.org
National Institute of Standards – www.nist.gov

**Europe**

CEN/ISSS , eBES - http://www.cenorm.be/isss/Workshop/eBES/Default.htm
e-Centre (UK) - http://www.e-centre.org.uk/

**Asia**

eCOM (Japan) - http://www.ecom.or.jp/ecom_e/
TradeGate (Australia) - http://www.tradegate.org.au/

We encourage others whom we have missed here, particularly in-country organizations, to contact us with their information please.

## *Excerpts from sources*

The following is a related excerpt from work in Japan by the Electronic Commerce Promotion Council of Japan, (eCOM) and published in 2002.

## ***Trends in Introduction of Internet EDI (XML/EDI)***

## *EDI communication methods and state of XML/EDI use*

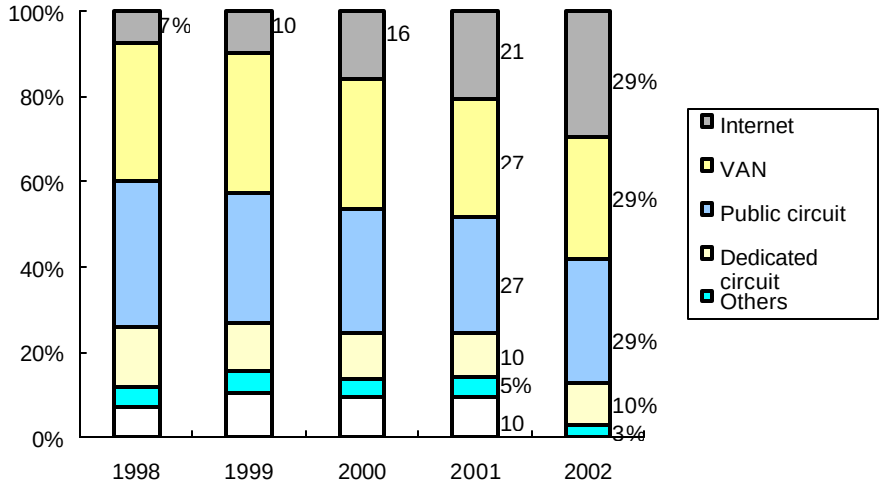
(1) State of the EDI communication connection

Internet EDI based on the Internet and Internet technologies has made its debut in 1996 in Japan and is spreading widely because of the ease of introduction and low operation costs.

According to the report of the Electronic Commerce Promotion Center of Japan Information Processing Development Corporation (JIPDEC/ ECPC) and Japan EDI Council, use of Internet EDI is growing every year at the average pace of 46% each year.

(See **Figure 1.1 State of the EDI Communication by Type of Connection**)

**State of the EDI Communication by Type of Connection (in percentage)**




Source:

(1) Data based on "Survey Report on Domestic and Overseas EDI 2002" (JIPDEC/ ECPC, March 2002) (Questionnaire forms distributed and collected in December 2001; questionnaire survey canvassing 3,009 business enterprises belonging to 63 JEDIC members and industry organizations.)

(2) Valid responses in 2002 numbered 492 enterprises.

(3) Percentage of cumulative total responses, with each company giving multiple responses. Cumulative total number of responses in 2002 is 1,146.

**Figure 1.1 State of the EDI Communication by Type of connection**

(2) Communication methods for Internet EDI

The breakdown of communication methods selected for Internet EDI is shown in **Table 1.1 Communication Methods for Internet EDI**.

Web type EDI accounts for more than 50 percent.

**Table 1.1 Communication Systems for Internet EDI**

| Type of communication methods | Cumulative total number | Percentage |
|---|---|---|
| File transfer type | 160 | 26% |
| e-mail type | 126 | 21% |
| Web type | 327 | 53% |
| Total | 613 | 100% |

Source: (1) Data based on "Survey Report on Domestic and Overseas EDI 2002" (JIPDEC/ ECPC, March 2002)
(2) Number of communication method types selected by business enterprises engaged in Internet EDI.
(Respondents allowed choice of one or more responses.)

(3) State of XML/EDI application

Questionnaire findings on use of XML/EDI are shown in **Table 1.2 State of XML/EDI Application** in Japan. In 2002, 34 enterprises (more than 7%) either "already use XML/EDI" or "currently making preparations for introduction". 91 enterprises (19%) expect to "introduction within the next three years". In the survey of JEDIC members, roughly 20% are planning to introduce XML/EDI systems.

**Table 1.2 State of XML/EDI Application**

| State of use | 2002 | | 2001 | |
|---|---|---|---|---|
| | Number of companies | percentage | Number of companies | percentage |
| System already in use | 12 | 2.5% | 5 | 1.2% |
| Currently making preparations for introduction | 22 | 4.6% | 17 | 4.0% |
| Planned to introduce in the next three years | 91 | 19.0% | 93 | 21.6% |
| No plans | 355 | 74.0% | 315 | 73.3% |
| Total | 480 | 100.0% | 430 | 100.0% |

Source: (1) Data based on Survey Report on Domestic and Overseas EDI 2002 (JIPDEC/ECPC, March 2002)

Activities in various industries to introduce XML/EDI systems are growing. Especially in industries with advanced users, ebXML specifications, recognized as international standards, are being adopted.

## *Additional Resources:*

For SOAP related information:

Introduction to Microsoft's SOAP tools and its own extensions:
http://www.xmlfiles.com/articles/adam/soapsoup/default.asp

Apache Project SOAP resources: - http://www.apache.org/

Discussion of latest W3C work on SOAP -

#1 - Don't Rush to SOAP 1.2 Conversions
Rich Seeley, Application Development Trends

Developers need not rush to convert existing applications to use the SOAP 1.2 specs, completed by the W3C last week. So says Rich Salz, an architect who worked on the early stages of the messaging specification. "What SOAP 1.2 brings to the table is that it is a clearer and more rigorous spec and it's more transport-neutral. It uses HTTP better, more in the spirit of the Web. It is neutral about HTTP vs. anything else."

http://www.adtmag.com/article.asp?id=7680

#2 - SOAP Cleaned Up for Real-World Deployments
Vance McCarthy, Integration Developer News

After rigorous testing and review, the W3C say we could have a final SOAP 1.2 spec next month. The group has resolved interoperability issues and made hundreds of other technical fixes. Further, the legal clouds that hung over royalty-free SOAP have dissipated, as the vendors that threatened to sue for property rights have changed their minds.

http://idevnews.com/TipsTricks.asp?ID=77