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Eighth session, 27-30 May 2002

Revised proposal for a UNECE Trade Facilitation Recommendation on Providing Guidance to Implementors of Electronic Business

Submitted by the Head of Delegation of the United Kingdom *

Revision of a document which contains a draft text which the United Kingdom wishes to be considered as a starting point for a recommendation for providing guidance to countries implementing electronic business.

* This present document is reproduced in the form in which it was received by the secretariat.

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Background to paper

Over the past few years there has been much hype surrounding the growth and implementation of electronic business across the world. This hype led to a boom-to-bust environment whereupon caution and 'good business sense' were abandoned in the race to find quick win business solutions on the Internet.

Following major stock market crashes in 2000, a spirit of pragmatism has emerged. EDI, which was considered 'dead' by many commentators is now seen as a basis from which to apply practical experience into future electronic business technologies, such as XML.

The UK delegation believes that the time is right to provide a UN/ECE recommendation which outlines some good business practice and advice for countries who wish to implement electronic business in a pragmatic way, utilising the array of UN/CEFACT standards and deliverables.

The UK requests the UN/CEFACT plenary to identify a working group within UN/CEFACT which will develop a trade facilitation recommendation for providing guidance to countries implementing electronic business. The attached text is a draft which the UK wishes to be considered as a starting point for such a recommendation.

- DRAFT FOR DEVELOPMENT -

Revised proposal for a UN/ECE Trade Facilitation Recommendation on Providing Guidance to Implementors of Electronic Business

Introduction/Preamble

This paper proposes that governments should re-assess how electronic business is in practice implemented and used, and restate their objectives and means for its cost-effective deployment. This will help to transform performance in key economic sectors and will support a more profitable allocation of resources.

Scope

Recommendation outlining an approach towards implementing electronic business based on UN/CEFACT standards.

Recommendation

a) Adopt a Business Framework Approach

A business framework approach will provide an effective and efficient means to:

- Quantify business objectives
- Determine best business and administrative processes and value chains
- Identify organisational structures
- Specify Key Performance Indicators (KPIs)
- Identify Communication requirements

See Appendix 1 for further detail.

b) Apply Electronic Business to the Framework Approach

Choose key elements of electronic business to support the above business framework. It is best to start with areas that are most likely to succeed for electronic business implementation. These areas are likely to include:

- Joint value chain management between buyers and sellers. This includes managing both ongoing operations and major changes;
- International trading;
- Buying and selling, market making (auctions, tenders etc.);
- Interactive communications with end users;
- Major project management – design, development, simulation, control, testing etc;
- Simplified accounting and administration.

See Appendix 2 for further information.

c) Implement Simplification Principles

Apply simplification principles, such as:

- Identifying best practice processes
- Utilising standard data elements
- Pre-aligning master data among value chain participants
- Using standard codes to link transactions to master data

See Appendix 3 for further detail.

d) Utilise UN/CEFACT Standards and Recommendations

Adopt the global standards developed by UN/CEFACT for electronic business appropriate to your needs, all of which are increasingly based on the same simplification principles. This will be supported by the National Trade Facilitation Bodies, the subject of UN/ECE Recommendation 4.

Appendix One – Adopt a business framework approach

The adoption of electronic business should be viewed from a business perspective first and foremost, rather than be driven by technology. The following points will assist in this regard.

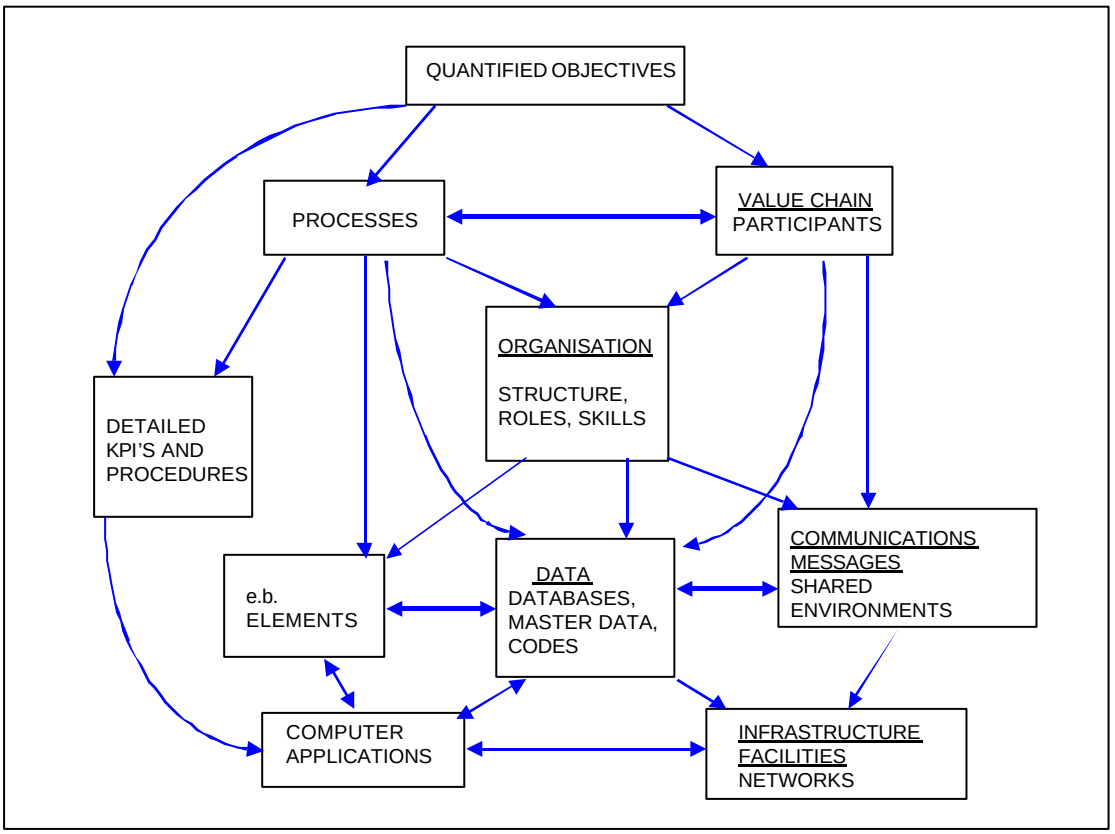
i. Clarify and quantify the key objectives which better processes will support, e.g.
- Specific levels of service for citizens, or for (and by) businesses, from government departments
- Specific fast clearance times for goods at ports
- Target costs for specified goods and services – i.e. better provision with less resources, inventory, waste and improved capacity utilisation
- Identify the business and administrative processes and the associated value chains which are key to each country (where and how net added value is to be maximised by buyers/users, sellers, agents, official bodies, decision points, etc.) to achieve the required levels of speed, certainty and low total costs in the most simple and standard ways.

ii. Identify the organisational structures and management skills to implement and manage these processes. Value chain management skills need to be specifically identified and developed.

iii. Define the detailed procedures and key performance indicators which will enable the processes to function well in a disciplined way.

iv. Define the required communications and flows of data among the value chain participants – who needs to know what and do what, when, where and how.

DIAGRAM 1



The ideal sequence of decision taking is:-

1. Quantify objectives
2. Define required business processes and their associated value chains and participants to achieve these objectives
3. Define the organisation to manage the processes and value chains.
4. Agree key performance indicators to enable the organisation and value chain to operate the processes well, in order to support the achievement of the quantified objectives. Define the associated detailed procedures.
5. Define the associated data flows and communications
6. Define the required data bases, computer applications and electronic business components
7. Define the infrastructure and facilities to support the above
8. Ensure that benefits exceed costs within realistic timescales

Clearly, there are existing organisations, existing computer applications and data. Therefore, in practice there will need to be an iterative approach. It is essential to remember, however, that processes and value chains serve objectives, organisations serve processes (and not vice versa), and computer systems serve processes and organisations. Applying electronic business or computer packages to unreconstructed processes, or implementing new organisations before re-defining processes, are likely to be unsuccessful.

Appendix 2 - Application of Electronic Business to the Framework Approach

1. Electronic business for Value Chain Operational Performance

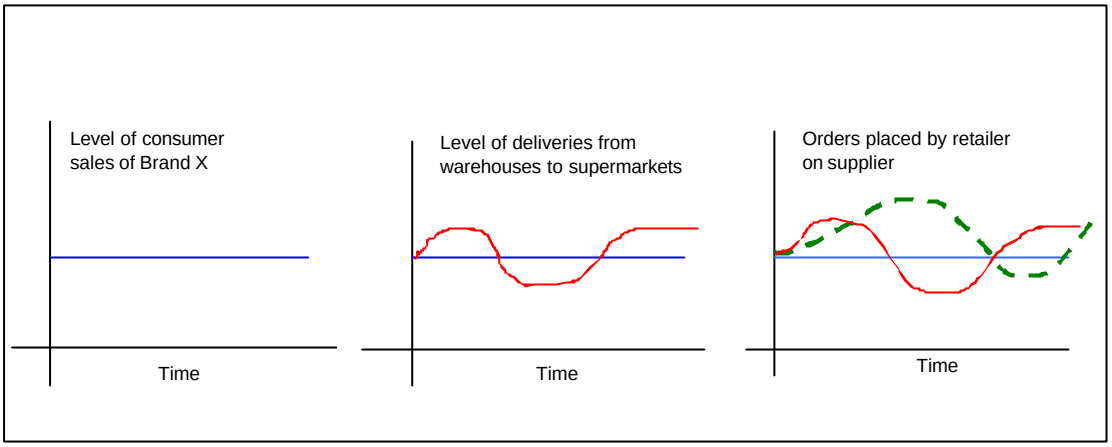
The key objectives in running a value chain (or supply chain or logistical network) are to achieve a high level of customer or end-user service (and therefore high sales where there is marketable product) at a low total cost. Where organisations (buyers and sellers) do not share accurate and timely data and solely communicate by sending orders and invoices to each other at the last minute, the following problems are likely to arise because of uncertainties about future demand and supply:

- Poor customer service (and therefore loss of sales)
- Higher levels of inventory – remember that "information replaces inventory in the modern value chain"
- Excess production, distribution and storage capacities
- Higher resource and operational costs because of the above

Only by sharing accurate master and transaction data across a value chain can all parties be sure that they are responding to the same market stimuli and not to particular or even misleading interpretations. It is essential to recognise that the most effective management of a value chain requires both (a) managing events, changes and key projects, which result in volatility for existing operations, and (b) managing ongoing operations.

There are many examples from different industries of how uncertainty increases rapidly across a value chain when each participant communicates with his sellers solely by sending orders whenever stock levels become too low. For example, consumer sales for Brand X could be steady in the supermarkets (see Diagram 2.1). Deliveries from regional warehouses to the supermarkets might vary depending on the total pattern of activity in the warehouse or the availability of transport or loading bays. The orders placed by the warehouses on sellers can vary even more from the steady state depending on the way the total business is managed by the retailer. When the management of each function in a public, private or joint value chain behave as 'silos', inhibiting collaboration and transparency of information, unpredictability and cost grow across that chain in relation to the number of participants and stages.

DIAGRAM 2.1



(Examples of the Forrester Effect (The Silo Syndrome) – see Ref 1)

By the time the demand signals get to the factory, and thereafter to the materials supplier to the factory, they can be wildly at variance with consumer demand. Traditionally, the only information received by any seller has been the order from his buyer. The seller has therefore invested a great deal of time and effort over the years to forecast orders better, but with limited benefit. This is because many of the causes of the Forrester effect are unpredictable, and also because when a new product goes on sale, or an existing product is sold in a new way, this is unique and substantially unpredictable. However electronic business enables a rapid response to actual demand.

It is more effective to share information, electronically, about:

(a) Real consumer or end user demand, eg. electronic point of sale data communicated automatically to sellers within 24 hours. Increasingly data will become available directly from homes and offices (or from personnel at the 'front line') about true consumer use, eg. from fridges and appliances. Such data has been available for many years in of industry, e.g. telemetry directly from raw material silos to suppliers. Best performance at lowest total cost cannot be achieved without this end user focus.

(b) Why orders might vary at times from this level for operational reasons – eg. shortage of storage or transport or operational capacities and/or high levels of sales of other products and services. Therefore forward intentions to order (or not), to move, to receive etc. should be shared.

Using electronic business to support this in a timely manner means that all participants in a value chain are focused on servicing the end consumer and on responding in a cost-effective way to an agreed method of running joint operations.

A combination of the following data should therefore be made available via electronic business to reduce uncertainties among business partners and their various functions.

- Sales, deliveries, movements, services to be provided – actual and planned
- Inventory levels for materials and/or finished goods – actual and planned
- Production and distribution – planned and actual performance
- Available capacities for production, distribution, storage, administration, operation etc.
- Financial payments and receipts and associated prices
- Most importantly, where practicable, real end user demand and use. (See Diagram 2.1)

No two value chains will require sharing all the same sets of data. Each participant needs to agree with his business partners what combination of data from the above is most suitable for them to share in order to reduce uncertainty and to improve speed and accuracy of response. Similar scenarios and processes need to be developed for public sector value chains.

One of the key difficulties in operating a supply network is coping with the volatility imposed when a major change is introduced, such as a new product, a new service, or an existing product at a new price (eg. a promotion). These are difficult to prepare for, since demand, and often supply, are unpredictable. Forecasting is very difficult, joint planning is essential. Plans have to be made well and shared as described above. However, it is essential to formalise the sequence of joint decision-taking, and to agree how response to actual events (to real consumer purchases and usage) and to further changes to plan are to be handled. All functions in each buyer and seller organisation need to agree when each decision has to be taken, by whom, and what data is involved, in order to achieve success on launch day. Lead times need to be realistic, and changes need to be communicated and managed systematically.

Electronic business enables each function to define roles and responsibilities, sequences of decision-taking (workflow), and required supporting data in such a way that all parties are working to a common plan. Common data is shared, while confidential data is made available on a 'need-to-know' basis. i.e. individuals in collaborating companies see the same Internet screens as their colleagues in corresponding functions in their buyers and/or sellers. Buyers see the same relevant information as salesmen, and supply chain managers see the same relevant information as production and distribution planners. Some data will be common to all, some will be specific to a few personnel. Decisions taken (provisional and formally authorised) and confirmed data are automatically downloaded into each company's computer systems and applications. In this way, all relevant internal and external physical and financial data and plans are systematically aligned on an ongoing basis. This maximises the chance of orders being fulfilled, deliveries being accepted, and invoices being paid etc. on time and in full.

Such Collaborative Event Management Systems have been available over the Internet since 1998. They also enable the timeliness and accuracy of decision-taking to be measured for each function and individual. This supports a new transparency of performance, which is vital, but which can be challenging to introduce. Consequently, and yet again, the successful application of such elements of electronic business requires management and cultural changes as well as process and computer changes – i.e. a sustained commitment to collaboration. This may well include enhancing the role of value chain managers to ensure that the overall process of collaboration works well, without diminishing commercial focus. Ongoing training is essential, and reward mechanisms will need to encourage effective collaboration as well as functional, departmental or company success. I.e. discourage the "silo syndrome".

Actions

(a) Establish value chain performance objectives relating to service, cost etc.
(b) Define data to be shared with buyers and sellers, agents and authorities. Define end-user data to be made available to focus value chain performance.
(c) Use standard data. Separate transactions from master data. Establish unitary, accurate master data, synchronised with value chain partners using standard codes.
(d) Commit to collaboration and develop a supportive culture.
(e) Implement 'role models' to plan and manage change via collaborative event management and major project management. Develop supportive shared working environments.

2. International Trading

The overall objective should be to facilitate international trade through the simplification and standardisation of trading processes, practices and procedures in order to achieve optimal speed, certainty and total cost for all parties, including satisfying the legitimate needs of authorities.

Governments therefore need to define, develop and implement best practice in order to improve the performance of each country and the Global Economy.

Much has been done to standardise documentation, but much more needs to be done to improve the key trading processes, which will in turn lead to simplified documentation.

Actions

(a) Define simple, predictable, and uniform controls by Customs and other bodies at the border
(b) Establish rules-based trade administration so that regulations and procedures are clear, understandable, transparent, and are well implemented and communicated
(c) Develop pre-approval declarations and post-release audits so that entry to and departure from countries is prompt and certain
(d) Agree targets for order clearance and other measurements for key points in the trade chain so that performance is spotlighted and positive trends are encouraged
(e) Develop risk assessment and profiling so that authorities focus well on the key problems, and honest traders are not disadvantaged
(f) Agree one body to be in control at borders (eg Customs) so that there is an integrated focus of authority. At the same time, ensure that all official bodies who need to collect data at borders on the movement of goods (and people) do so in an integrated way which is cost-effective for all parties.
(g) Encourage the dissemination and locking-in of best practice in all countries – developed, less-developed, large and small
(h) Promote awareness of cultural and economic issues which can affect border crossings and trade
(i) Continue the development of standards for documentation and the presentation of information. This should be based on the UN/ExDocs initiative. This allows traders to complete standard international trading documentation on-line, and communicate it electronically (by Internet or EDI) to anywhere and to any organisation in the world (including printed UN/TOPFORM documentation if needed).
(j) Improve payments mechanisms, including letters of credit and other financial services, so that traders are not discouraged by the costs complexities or delays which can occur within the financial systems which support international trade

3. Electronic business for efficient Market-Making

Electronic business provides a great opportunity to improve markets for buying and selling. It supports communication with more potential buyers and sellers, and enhances speed and certainty of determination of prices and volumes. It therefore, according to classical economics, improves information, competition and establishes 'better' prices. Electronic business can also be used to systematise the process of buying and selling so that total costs are reduced. Hence profitability can be improved through lower prices, improved sources of supply and reduced costs of procurement and/or of selling.

The key components of electronic business for market-making are:-

(a) electronic auctions – there are various auction types that can be conducted electronically, e.g. conventional auctions, reverse auctions, Dutch auctions. Pre-requisites are:-

- a clearly defined and understood specification for what is required – product, service facility etc. Agreed and guaranteed quality standards are essential.

- a number of sellers who are 'equally' capable of providing the product or service on time, within specification and with any necessary support
- a significant number of occasions on which an auction will take place, i.e. electronic auctions are more applicable to buying office supplies and bulk chemicals than aircraft carriers and new aircraft engines.

Financial market-making has been well established electronically for many years e.g. foreign exchange, equities and bonds etc. Those setting up new electronic exchanges would be well advised to review the history of electronic financial markets.

Improved competition can result in significant reductions in prices quoted. New sellers may be identified via electronic markets, as can new products and services. Clear prior understanding of the 'rules', and their consistent application, are essential for success.

It is wise to undertake trials of all electronic market-making to obtain a sound understanding of what works well before committing to a major investment.

(b) electronic tendering

Whilst there are similar pre-requisites to those for electronic auctions, electronic tendering is more likely to be of benefit where product and service specifications are more complex and where greater input is required by buyers to compare and contrast the offerings by sellers. Substantial benefits arise from the simplification and standardisation of both the tendering process and its subsequent consolidation into formal contracts. It is important to ensure that both bids and specifications are secure in order to build confidence in the new processes.

One of the main factors hindering the improvement of buying and selling is the diversity and complexity of processes for negotiation and contract-making, (as well as the idiosyncrasies of buyers). Electronic business can enable more common and easy-to-use processes thus reducing the costs for all parties, and thereby encouraging more potential sellers to participate. Better use can be made of buyers' time by restructuring buying processes and enabling them electronically.

Actions

(i) Identify well-defined goods and services with several potential sellers.
(ii) Undertake trial electronic auctions.
(iii) Simplify and standardise tendering and contracting processes, and electronically enable them

4. Electronic business in the public sector

Electronic business can support public sector needs to:-

- Provide integrated information more simply and cost effectively to citizens on regulations, right and benefits etc.
- Take information more easily and accurately from individuals, businesses etc. and process, analyse and disseminate data
- Provide more speedy and integrated methods for giving authorisation
- Pay benefits to claimants more cost effectively
- Receive payments from individuals and businesses
- Monitor actions and movements, eg. At ports, via an integrated method of collecting and disseminating data for all authorities without hindering trade. i.e. to ensure 'joined-up' requirements from all government departments which can be completed by traders once with minimum cost and delay

- Endeavouring to use data which has been captured cleanly once for all relevant purposes of all parties using seamless integrated transactions
- Buy and sell more cost effectively: tender and contract – see Section 4 above.
- Undertake intra- and extra-governmental transactions
- Undertake voting and canvassing peoples' views
- Support for education and training, in the office, at home etc.
- Plan and manage change projects
- Improve the ease of doing business – e.g. supporting the completion of official international trading documentation in such a way as to ensure accuracy and to maximise acceptance across all frontiers (see Appendix 2, section 2).

5. Electronic business for end-user Communications

Electronic business has huge potential to link with every home, office, transportation system and other location in the globe and beyond. It can support the provision of information, the collection of data, the encouragement of dialogues and interaction, as well as promote new communities of shared interests and more dynamic ways of joint working. Clearly, electronic business provides major opportunities for direct selling to end-users. Therefore, value chains can be simplified to eliminate stages which do not add sufficient value. This is the process of only retaining truly beneficial intermediaries (sometimes referred to as the "disintermediation" of the value chain).

The end-users of electronic business can be consumers, buyers, employees, citizens, clients, patients, business partners, armed forces and police and so on. There are great opportunities to sell to and buy from, service and support, communicate with, learn from and teach, all of these in a more cost-effective way.

The following questions need to be answered to ensure that electronic business can be profitably applied:

	QUESTION	ISSUE
1.	Who are my end-users?	- how to identify, register and track. Where do they congregate on the Internet or other network? Define the community of interest e.g. mothers or football fans, social security claimants, etc.
2.	Are they on-line?	- are they able to access PCs, interactive TV, mobile phones with Internet capability?
3.	Am I clear what I want to communicate and how?	- Messages and displays need to be simple and phrased in end-user terms. How are user reactions and responses going to be monitored . Remember that most people already receive too many messages via many media. 'A wealth of information results in a poverty of attention'.
4.	Will users be able to communicate with me quickly, easily, securely and cost-effectively?	- Most homes and offices do not yet have high-speed low cost communications capabilities. e.g. mobile phones can only cope with limited volumes of data, and most PCs and interactive TV are slow speed. Can your data and electronic business facilities be organised in a form that is easy to access and use? Do your users want to communicate with you in this way? The Internet 'forest' is huge, anarchic and rapidly growing. Therefore your messages need to be located where users will find them easily. This can often be achieved by taking messages to

		where your consumers etc. may congregate on the Web rather than expecting them to come to your site. Are you and your end users confident in the security levels for data and transactions?
5.	Who will pay for the service?	- will you bear the costs? Are the end users willing to pay? Is there an opportunity to raise funds by providing advertising opportunities (would this cloud the message?)? Many people regard Internet services as a 'free good', i.e. worth accessing so long as there is no charge.
6.	Are my information and data accurate?	- have you maintained up-to-date and accurate data on the products, services or facilities you are offering? Will your users respond to it correctly or is additional data needed? This is an essential and demanding area of effort. Remember that your suppliers are often the best sources of data on their products and services.
7.	Can I measure the results and compare with alternatives?	- measures of use and response of electronic business systems need to be established, e.g. 'hits' on an Internet site are a misleading measure. Users need to be uniquely identified and their usage and reactions logged. If, for example, important buyers already have accurate data on what they wish to order, they should automatically transmit their orders rather than complete them on Internet screens. If buyers cannot be trusted to complete Internet orders for the correct products and quantities, other selling methods (such as telephone selling, or even traditional sales people!) need to be employed.
8.	Will my supply chain provide the service the user needs?	- making an offer of a product or service to a user can be the easy part of the transaction. Your value chain has to be capable of delivering the product as required, on time, and at an acceptable total cost. Service levels for electronic business usually need to be at a higher level than in conventional business since greater expectations of dependability may well have been raised in the electronic offering, and since immediate and acceptable substitutes may not be to hand for the user.
9.	Last, but not least, can I make a profit or ensure that my benefits exceed my costs?	There are no magic solutions from electronic business. Nevertheless, there are major and unique opportunities. Wise and focused investments should be used to stimulate learning by doing.

6. Electronic business for major project management

Many public and private organisations are involved in projects which run for a number of years, involve great volumes of resource and money, and are subject to major technical and other uncertainties. How does electronic business improve the speed, certainty and total cost of these?

Again, the benefits come via

- redefining the processes by which various functions and organisations collaborate – promoting simplification and standardisation
- defining the information and data to be shared – promoting relevance, accuracy, accessibility, transparency and change management
- creating an environment within which collaboration will flourish and synergies will result – promoting agreement, responsiveness and agility
- focusing on reducing uncertainty wherever possible in relation to both what is required and what can be supplied. In this way to reduce both implementation lead times and total cost. Managing change systematically in complex technical environments so that all parties see the same up-to-date picture and can log the changes, and so that demand and supply are continually brought back into a balance acceptable to both buyer and seller.

The key electronic business facilities required relate to:

Project Strategy – agreement on how the project is to be managed, on joint processes and relationships

- Project Definition – agreement among buyers and sellers on what needs to be and can be achieved
- Project Planning – critical path analysis, GANTT charts, e.g. MS Project, Collaborative Event Management e.g. using EQOS Software (See Appendix 2, section 1 above) – in total and for each project piece.
- Project Costing
- Project Management and Control – ongoing monitoring of performance, costs and management against objectives
- Risk Analysis – analysis of real risk (likelihood/size/consequences) and focus on reduction. It is important to ensure that risk is not only identified but also formally assigned to a specific party.
- Collaborative Working – shared working environment, including e.mail, workflow, document management, records management. This can begin simply and evolve to a high degree of sophistication. SWE's or CWE's are fundamental to support all these electronic business facilities and the teams who use them.
- Knowledge Management – data bases, documents, publications, 'Yellow Pages', news, presentations, best practice examples, standards
- Design and Development – Computer-Aided Design, simulation, evolutionary prototyping, product component analysis, configuration control, product life cycle data and documentation to manage enhancements to plant and equipment in a rigorous way, throughout their working lives through to disposal. Many complex products such as aeroplanes, ships, vehicles, engines and buildings can now be collaboratively designed, tested and simulated in working environments using electronic tools including virtual reality software. This saves time and cost, for example, in not requiring the construction of physical models nor costly changes at late stages of implementation.
- Tendering and Contracting – electronic auctions where appropriate, electronic tenders, structured contract-making, reviewing options, setting performance standards and providing measures, change control, intellectual property management
- Administration – who administers what, how and where
- Manufacturing and Production – build state, performance, capacity utilisation, cost control
- Integration – bringing together all the components, including hardware and software - often the most difficult task
- Testing and Evaluation

- Acceptance and Handover
- Training and Education – self tuition, simulation, electronic manuals
- On-going Support – service, spares, data on production facilities

These components of electronic business for major change projects can be used to improve lead times, performance levels and total costs for product design and development and for introduction to effective use. No two major projects are the same. Consequently net benefits arising from each electronic business component will vary per project. Nevertheless, common threads of benefit can be established for each type of project. More simple and standard processes can then be agreed to be enabled by the most promising electronic business components. Focused trials of these are essential to highlight costs as well as benefits, along with organisational and technical pre-requisites. Joint learning by joint collaborative working is invaluable.

7. Electronic business for Streamlined Administration and Accounting

One of the great areas of potential for electronic business arises from its ability to support the storage and processing of data wherever it is most cost effective. Traditionally, each organisation does its own accounting and administration. A government department or business will, for example, raise an order, log a delivery into inventory, cost the goods received, match the invoice against the expected costs, and effect payment against each invoice on a statement. The accounting system balances the physical and financial flows.

If an organisation has developed a strong value chain partnership with a seller who can be trusted to deliver on time the agreed quality and numbers of products ordered, he could also be trusted to undertake the raising of orders by his buyer's staff on the seller's own computer system, and also to do the detailed accounting for each transaction. The buyer could then interrogate the seller's computer applications and data bases to answer specific questions on volumes, prices, values and performance, rather than use his own computer systems.

It is a basic principle of electronic business that sellers are usually best placed to provide data on their products and services. Do not duplicate what your sellers should already have done well unless clear value is being added. Certainly ensure that your data is not in conflict with your sellers' data. It is vital to ensure that your sellers are capable of supporting you reliably in these ways.

Hence value chain collaboration can extend into accounting and administration, subject to agreed methods of audit and control. There can be self-billing of the seller by the buyer, or direct debiting of the buyer's account by the seller, and financial summaries from seller to buyer instead of detailed ledger reconciliation by the latter. New rules of accounting and audit may be needed in certain circumstances, notably in public sector organisations, to allow the full benefits of joint value chain management and of electronic business.

Appendix 3 – Apply Simplification Principles

1. Introducing Simpl-eb principles

The concept of Simpl-eb (see Trade/Cefact/2000/24 for a detailed introduction to Simpl-eb) was developed in order to simplify electronic communications that are fundamental to supporting the physical movement of goods and services. Initially developed as a simplified sub-set of the UN/EDIFACT EDI message standards, and more recently embodying internet technology, it proposes guiding principles and objectives that can drive efficiency and lower costs. The objective is to develop low cost technical solutions, enabling all companies, regardless of geographic location or size, to engage and participate in electronic business that will enhance the overall performance of the virtual economy.

Taking the above in to account and building on 20 years of EDI experience, the following guiding simplification principles were identified:

a) Simple, Standard, Best Practice, Processes across most public and private value chains

Simpl-eb is business-led. The prime motive is to be driven by best practice business processes, not by technical innovation in IS communication and technology. Throughout we assume that:

- Only by simplifying and standardising joint processes across a value chain can businesses and institutions achieve speed, certainty and low total cost. The greater the degree of simplification and standardisation the easier it is to apply electronic business and the greater the benefits to be derived.
- Only business process definitions which contribute directly to a cost-effective value chain are included. Redundant process steps are eliminated. Although proper control mechanisms are of course required for good corporate management, no unnecessary administration, double-checking or "just-in-case" activities are included.
- Every activity is clearly assigned to the role or "actor" responsible, and it is then required and assumed that the "actor" will carry out the activity correctly.
- The information required at each stage is kept to the minimum which can actually be used and is necessary to perform the next step in the process – redundant information is not included, either in communication between actors or in superfluous information presented to the actor. Nevertheless visibility and transparency of data across the value chain which are necessary to support better joint decision-taking is to be promoted.
- Each communication of a transaction should correspond to a single physical event in the process chain. This hugely simplifies how the receiver of the communication processes the data received. A good example of this is the decision to base the Simpl-eb process on the principle of one or more items being delivered to one location at one time. This is because the physical delivery can only be of one or more items to one place at one time. To run an effective value chain the recipient has to be able to say that a delivery relates to an order, and an invoice relates to a delivery. Therefore one order, one despatch advice, one invoice. This keeps the processing of electronic communications very clear and simple.
- All key public and private value chains have most basic transactions (such as the order to move, deliver, process etc) in common.

b) Independence from Syntax and Technology

Technology is constantly developing. A typical business today is communicating through documents "transmitted" via paper, e-mail, barcodes, EDI (to various widely-different standards and syntaxes including GTDI, EDIFACT and X.12), various Internet technologies (using standards such as HTML, XML to many different implementations) – and possibly speaking in several different languages!

In the same way, the syntax used in EDI has constrained the data definitions. In EDIFACT, for instance, the definitions are closely related to and dependent upon the EDIFACT constructs of the hierarchy of the message and implicit definition by the position of the data within the message.

All technical solutions should be derived from the same business models and, in this way, businesses will only be concerned with the transcription rules to the technical solution. The definitions prepared in the business models must remain constant regardless of the syntax and technology by which the data itself is communicated. Then, as new technologies emerge, it is a relatively simple task to map the business model definitions into the possibilities and constraints afforded by the new technology.

Business process modelling is the key to achieving true independence from technology and syntax and to provide the required degree of "future-proofing".

c) Standard Data Element Definition

Ambiguity must be avoided. This starts by all participants in the value chain having a common understanding of the information which is going to drive their business. The definitions should be simple and direct in order to permit a robust application across a wide range of public and private sectors i.e. with all the main transaction with all of a business's key trading partners. Ambiguity results in re-keying or cross reference tables or mistakes, poor service and excess costs.

The objective is to harmonise each data element. It is essential that each element is

- understood globally
- defined unambiguously
- with identified synonyms (business terms) where necessary
- technologically neutral
- named accurately (based on ISO 11179)

d) Separation of Master Data from Transactions

The essence of achieving simplification in transaction messages is to strip out all the data, and especially more stable information, which cannot genuinely be regarded as critical to the processing of that transaction. Any data that is not specifically relevant to that particular transaction should first be examined to see if it is actually needed anywhere in the communications process, and if it is, it should be exchanged as part of a separate process, e.g. via master files or product catalogues.

In other words, simplicity is bought in two ways:

- Remove complexity from the business process - stop using unnecessary information. Encourage businesses and institutions to use simpler and more standard processes whenever appropriate. Any process benefits from the participants pre-defining and aligning the key information about who each is and what they are going to trade.
- Move information from the transaction - where it is redundant or stable, or adds processing complexity – to the master data where it can be separately accessed or processed.

Master data transmitted in a transaction is an invitation to impose manual handling into an otherwise automatic process. If the effort spent checking master data transmitted redundantly in a transaction message were instead concentrated on getting the master data right in advance of transactions, the transactions would be processed more simply, more efficiently and more accurately. Investing in effective and timely synchronisation of master data will always allow more efficient processing of routine transactions. For instance, simplifying 100,000 orders on an ongoing basis at the cost of being more precise about 1,000 product definitions and prices should provide benefits overall. The more electronic that business becomes, the more important it is to have accurate, separate master data.

e) Standard Codes linking Transactions to Master Data

In driving out ambiguity, special care needs to be taken on the identification codes used to refer to master data. These "identifiers" need to be like the data definitions – consistent across all participants

in the value chain and independent of technology and syntax. This leads to the use of standard codes such as the EAN•UCC Numbering System, which supports not only electronic information exchange but also physical automatic identification through bar-coding and (soon) RFID tagging, with identifiers which are guaranteed to be globally unique. It is highly desirable and cost-beneficial when the codes in the communications are totally consistent with the physical identities of the products.

f) Pre-alignment of Master Data

In order that the receiver of the transaction message can process the message and act correctly, both sender and receiver must already have achieved a common precise understanding of the data referred to and accessed by the identifier.

How this is achieved will vary according to circumstance. It is entirely legitimate to do so entirely by manual means, if the process is sufficiently robust, accurate and efficient and the data volumes are small. Recently electronic catalogues have become available, hosted by one of the parties in the value chain or by a third party as a service to the whole value chain. Other methods are also available including the direct alignment of bulk data by EDI. What is essential is that the alignment is prior to the first transaction, or else the transaction will require exception handling. Note that this is still better than sending the master data with each transaction, as then every transaction potentially requires exception handling!

g) Standard Messages for all Industries, Public and Private Sectors and Technologies

The simple concept of "order, do, invoice" is not limited to a small sector of trade or commerce. Furthermore, with a strictly limited number of clear precise unambiguous definitions and an identification system which can be used across all sectors, we move away from bilateral interpretations and restrictions. The Simpl-eb principles have already been found to apply to moving goods, processing materials, financial transactions, government procurement and areas such as health. This feeds back into the criteria for good standard data element definitions, to support the needs of many sectors whilst recognising the common requirements shared across them all.

h) Integration of Past, Present and Future – Performance, Action and Plans

Consistency is no less important across time. The data required to communicate plans is an exact mirror of the data required to act on a transaction. In effect, a plan is an order in the future tense. The same data element definitions, standard identifier codes and pre-alignment of master data is just as important for future plans as with current action and reports of past performance. Businesses will increasingly integrate their value chains by sharing forward plans and past performance data as well as exchanging current transactions.

This may be an area for special attention, as this is not an idea which many existing syntaxes have addressed. The business definitions must remain independent of the syntax and not be constrained by syntax limitations. Creative solutions to the problems of mapping the business requirements into each technology and syntax can then address this issue of "tense".

i) Separation of data definitions from presentation

In the same way that as business definition may be implemented in more than one technology, it is also capable of more than one presentation format.

From earlier UN/CEFACT work (SIMAC – Simpl-EDI Ad hoc Group), considering new technology in this area, it was recommended that the UN Layout Key (UNLK) be used as a basis for a uniform, generic electronic form layout to avoid a proliferation of layout forms. Even in the case where the UNLK is not used, it is recommended that the same data definitions be used in all cases.

2. Simplifying the purchase order (an example of Simpl-eb)

An order is for the delivery of one or more items/services to one place at one time, since a physical delivery (and its receipt confirmation) can only be of one or more items/services to one place at one time. An invoice can then match the delivery. This fundamental value chain process of ordering, delivery, invoicing and payment is necessarily based on physical reality and all subsequent computer applications and communications should reflect this.

An order can be to deliver, move, produce, treat, pay etc. i.e. the key value chain activities.The Simpl-eb Order consists only of standard, global codes for buyer, seller, products/services plus time/date, order number, order type, (to purchase, move, produce etc.) and quantities. (see diagram 3.1)

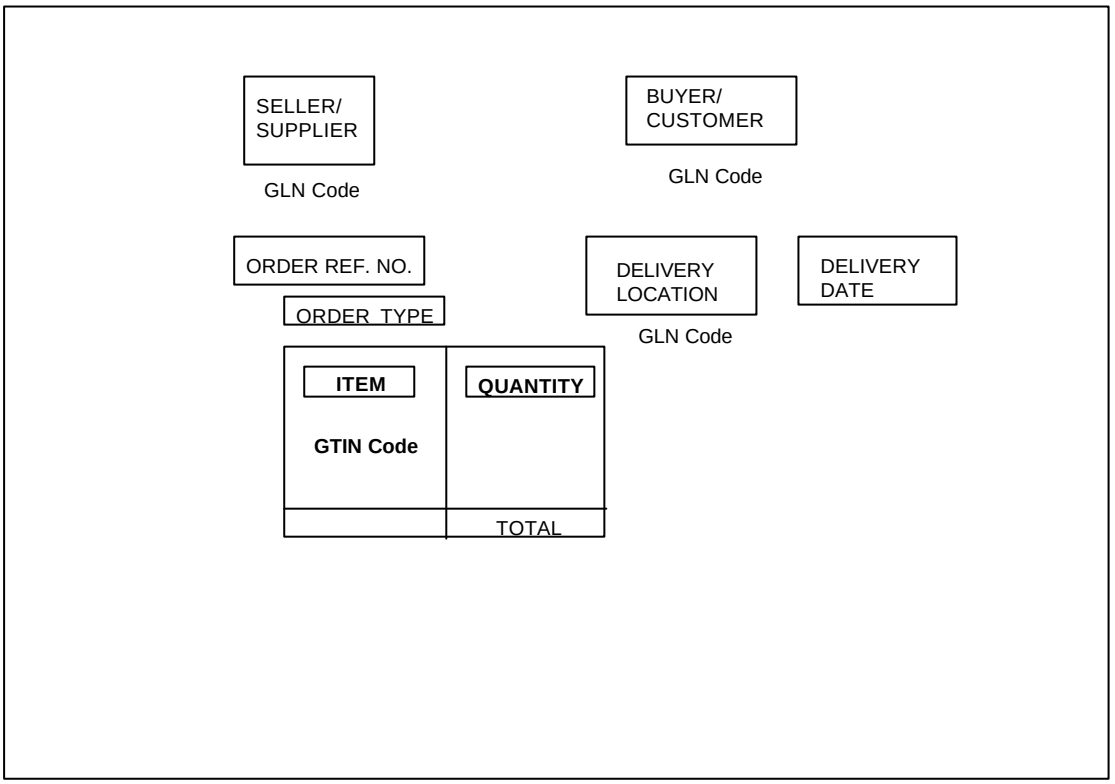


Diagram 3.1: Basic Components of a Simpl-eb Order

All key details about buyers, sellers, including trading locations, and about products and services are held in master files. These are linked to transactions such as orders and invoices by codes/numbers. Master files are made correct and consistent in advance of sending transactions by being pre-aligned or synchronised between buyer and seller. This can be done manually, but is preferably achieved by EDI, or other automatic data interchange, transmissions of master data, or by using a shared electronic catalogue somewhere on the network, or in a seller's application. (Diagram 3.2)

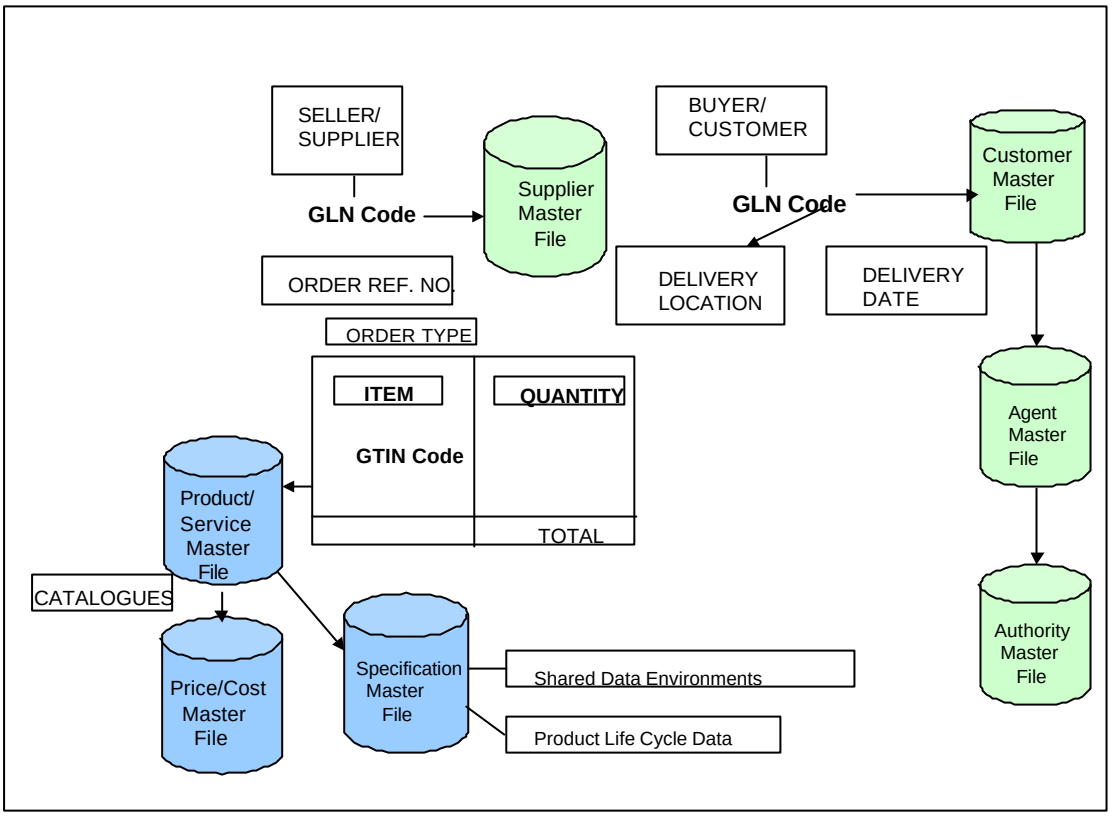


Diagram 3.2 Basic components of a Simpl-eb Order plus basic master file alignment

More complex transactions may also involve a third party Agent, such as a transporter, a bank or an insurance company, eg. for an export or import. Such a transaction might also involve an Authority such as Customs, or an Inspection body. Some transactions involve Individuals who may be employees, citizens, consumers or patients, eg. an order to a doctor to treat a patient. Master data may also be held on individuals who form a Team involved in collaborative working.

Additional information may be included on Products and Services such as prices or costs. Detailed technical information, designs and specifications may also be added in separate master data files such as Shared Data Environments. Product Life Cycle Data may also be held in this way to provide complete records of changes to a capital asset from 'birth to death'. (Diagram 3.3)

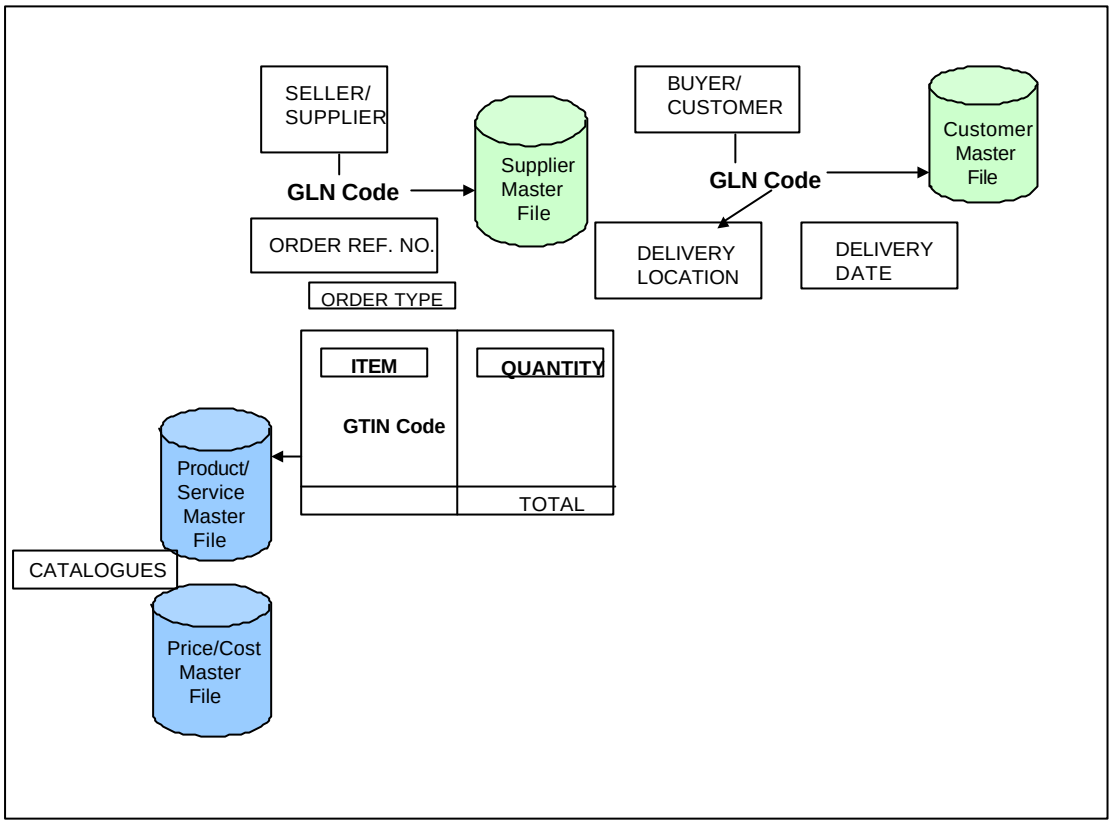


Diagram 3.3: Basic components of a Simpl-eb Order with complex master file alignment

On occasion, orders may involve reference to a process, treatment, or recipe. For example, an order to process a metal in a certain way, or treat a patient in a certain way.

Less often, an order might also refer to the use of a specific asset in a process. For example to x-ray a patient on No. 4 Scanner (its characteristics would be held in the asset file). (Diagram 3.4)

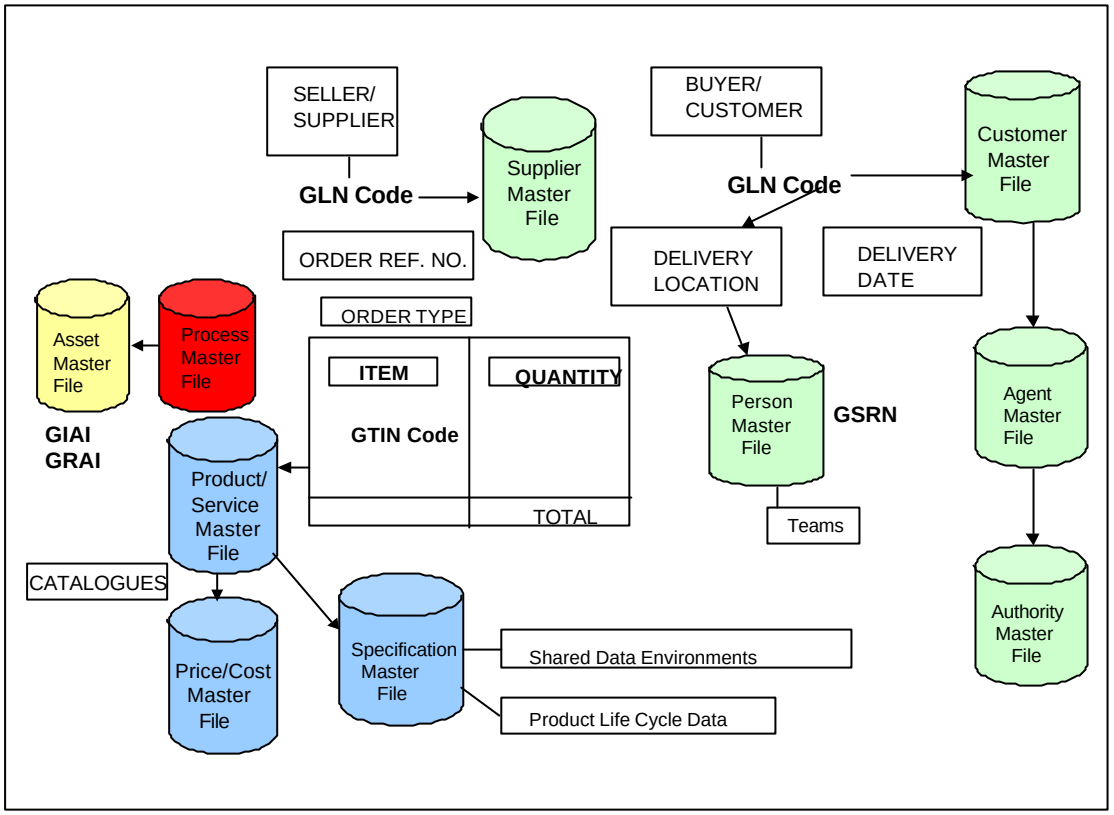


Diagram 3.4: Basic components of a Simpl-eb Order with complex master file alignment and additional process master data alignment

The Simpl-eb approach is independent of technology. It can be expressed in a standard way to support Internet communications via XML or automatic data interchange via UN/EDIFACT, or in whatever is the most relevant syntax. Simpl-eb is incorporated into the Global Commerce Initiative (major manufacturers and retailers of fast moving consumer goods), ebXML (which includes all the major suppliers of Computer Software for the Internet), UN/CEFACT developments (for electronic business and international trade facilitation), and EAN/UCC (for electronic business and product identification) .

3. Electronic business standards and master data

Master data can be constructed from the simplest components up to the most detailed. Thus, many trading partners may only wish to know the key descriptions, characteristics or prices of products. Fewer will wish to know detailed specifications. Extra master data need only be added as required. Accurate and shared master data is fundamental to successful business and critical to electronic communications. The more it is well structured and pre-aligned, the better run will be the value chain.

Reducing the cost of technological change and running cost-effective value chains require more simple and standard business processes to be agreed, and their supporting common data to be defined independently of the technology. Too often it is claimed that a new Information Technology, such as the Internet, (or Open Systems Interconnection, or UN/EDIFACT, or XML etc. etc.) will enable all parties to communicate without having to change internal processes or data. This is not possible. Rather we have to do the hard work first on processes and data, and protect these from technical changes.

Electronic Data Interchange (EDI) has been with us for over twenty years. It has been very successful in automatically communicating and processing transactions such as orders and invoices at a low cost wherever buyers and sellers have been prepared to agree standard processes and standard interpretations of data. Where businesses have had diverse processes and poor quality unaligned master data (notably for EAN/UCC product codes and prices), significant extra costs have been incurred to correct data manually and/or via cross-reference tables. At the same time, more orders, deliveries, invoices and payments have consequently failed. No new technology or syntax can solve these problems – only joint business change can do so.

Hitherto, paper systems and most computer systems of communication have depended on all the data required to interpret a message being within the message e.g. names and addresses and product descriptions are part of each order and invoice. If data which are common to many transactions (i.e. master data on buyers and sellers, and products and services) can be agreed and synchronised among value chain partners in advance of exchanging transactions and other messages, these latter need only contain variable data such as dates/times and quantities/values. The detailed information on buyers, sellers, products, services and other master data are linked to the transactions by standard identifying codes. Transactions are therefore simpler, more accurate and quicker (and easier) to process and action.

Master Data can be one of four main types:

(a) Value Chain Participants
  (i) buyers, customers
  (ii) sellers, suppliers
  (iii) agents – such as banks, insurance companies, freight forwarders, transporters
  (iv) authorities – such as Customs for international trade, inspection and certification bodies
  (v) individuals and teams – consumers, employees, citizens, patients, project teams, communities with shared interests or objectives

(b) Products and Services
  (i) descriptions – key features
  (ii) prices and costs
  (iii) detailed technical specifications and designs

(c) Processes
  - How to make or do, recipes, treatments

(d) Assets
  - The machines, equipment or facilities used in the process

Master Data are linked to transactions and inter-linked via standard, global numbering systems, such as EAN/UCC. This EAN/UCC Numbering System is relatively simple to administer and guarantees global uniqueness without ambiguity. It has excellent support in both electronic business (EDI and XML) and Automatic Data Capture (Bar coding and Scanning and Radio Frequency Identification).

- Value Chain Participants are identified using Global Location Numbers (GLN)
- Products and Services are identified using Global Trade Item Numbers (GTIN)
- Assets are identified using Global Individual Asset Identifiers (GIAI)
  Global Returnable Asset Identifiers (GRAI)
- Individuals, in relation to using a service (e.g. patients) are identified
  using Global Service Relation Numbers (GSRN)

It is fundamental to the success of much electronic business (as well as to running most successful internal computer applications) that accurate master data is held by all relevant value chain participants and pre-aligned among them. Failure to do so will result in errors, delays, poor customer service and increased total costs. Most governmental and company master data needs substantial improvement for both internal and external purposes. Much unnecessary inefficiency and cost are incurred because data supporting ordering, delivery, storage, invoicing, production and procurement are inaccurate and/or inconsistent.

Holding, maintaining and accessing master data can be done in a variety of ways:

(a) On the seller's system – the seller should be best placed to provide accurate data on his products and services.
(b) On the buyer's system – it may be most appropriate where there is one key buyer and many sellers for the buyer to copy data across from sellers' systems
(c) On third party servers or value added networks – industry catalogues
(d) On electronic market places or exchanges

These alternatives are in a process of evolution. Hence a focus on simplicity and cost effectiveness is essential. It is likely that the same data will often need to be held in more than one place for the foreseeable future. Hence the importance of accuracy and of using the body with the best data plus synchronisation or pre-alignment of data among the value chain participants. All the above demand reliability and security which in turn require collaboration and trust. Security is of particular importance to public and financial bodies.

A fundamental priority is to establish the key, common business processes, such as for ordering. Thus, the order to deliver, produce or do is the most basic and common of value chain transactions, and should be standard across most industries and countries. In this way, all sizes of business can benefit from simple, standard methods of operation.

Appendix 4 – Utilising UN/CEFACT Standards and Recommendations for electronic business

Requirement	**Available UN/CEFACT Tool**
Establishing a National Trade Facilitation Body	UN/ECE Trade Facilitation Recommendation 4
Business Process Modelling	UN/CEFACT Modelling Methodology (UMM)
Electronic Data Interchange (EDI)	United Nations Trade Data Interchange Directory (UNTDID)
eXtensible Markup Language (XML)	ebXML Specifications
Standard (paper) trading documents	UN/Layout Key, UN/ECE Trade Facilitation Recommendation 1
Utilising codes for international transactions	United Nations Trade Data Interchange Directory (UNTDID) UN/ECE Trade Facilitation Recommendation 16 UN/ECE Trade Facilitation Recommendation 20

Earlier work in this area includes:

- Report of the Chair of the Simac ad hoc Group to the CSG and UN/CEFACT Plenary
- Simple Electronic Business Standards – Simpl-eb (Trade/ Cefact/2000/24)