

B.e.e.

Business enabled electronically.

"The Future for e.business."



by Tom McGuffog



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Preface

B.e.e.

Up to the present, we have called the potentially great impact of electronic communications on the way business is done 'electronic business' or 'electronic commerce'. This has tended to reinforce the expectation that if business becomes electronic it will be revolutionised beneficially almost automatically and without fail. Hard experience has taught us that this is not so. I have therefore called this publication on the future for electronic business 'Business enabled electronically' to emphasise that better business relationships and methods come first and 'e' enables these. The potential benefits from electronic business remain great, but only if we look at the opportunities in practical business terms and only if we are prepared to change the ways we do business.

The B.e.e. analogy emphasises that 'honey' is only produced after a lot of effort by many workers across a sophisticated value chain (which begins with a multitude of blossoms and flowers and ends being consumed from the dining table). Drones (investment analysts?) and queen bees (technologists?) have their place; but the practical business workers and their interactions are fundamental to the delivery of the valuable end product. Now is an excellent time to get people to think effectively about the future potential of electronic business when money is tight and instant solutions are not readily available. Miracle answers and instant riches are out of favour, especially when high technology is involved. This document paints a picture of the great potential offered by e.business to those who are prepared to re-assess how they wish to do business, to those who are prepared to experiment and invest now for longer term benefits, to those who are willing to work collaboratively with their business partners, and to those who wish to be the most cost effective operators in their areas of business. Some of the key elements of B.e.e. have been available for many years, others are at early

stages of evolution. Nevertheless, there are sufficient available now to allow businesses and organisations to learn and to progress profitably by doing.

B.e.e. is necessary for future success, but far from sufficient by itself. B.e.e. will not create a new product nor guarantee demand for it, but can greatly aid its development and sale. It will not motivate a team, but can greatly improve the environment in which the team works. B.e.e. is an enabler, for better joint processes across a value chain, for better collaboration supported by sharing structured data to support common objectives, for better service and lower total cost through promoting speed and certainty of response, and for greater agility as the pressures and opportunities facing an organisation evolve.

This document describes the key principles of B.e.e. and indicates the steps that organisations need to take to realise its benefits. It focuses on the key areas of development for B.e.e.

- Joint value chain operations, including the management of change
- Running major projects collaboratively, including R&D
- Communication with end users, consumers and citizens
- Streamlined administration and accounting
- Market making, including auctions, tendering and contracting

Readers should view these as examples of the potential of B.e.e., with many common threads of relevance to each other and to other areas of the economy where B.e.e. can be successfully applied.

For example, B.e.e. can support public sector needs to:-

- Provide integrated information more simply and cost effectively to citizens on regulations, rights 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
- 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 ref 3 on ElecTra)
- Buy and sell more cost effectively: tender and contract
- Undertake intra- and extra-governmental transactions
- Undertake voting and canvassing peoples' views
- Support education and training, in the office, at home etc.
- Plan and manage change projects

This publication emphasises the need for collaboration among businesses and organisations participating in the same value chain, and for sharing standard data, in order to allow B.e.e. to play a cost-effective role in running value chains and organisations with greater speed and certainty and at a lower total cost.

Awareness of best practice and standards is fundamental to making profitable progress with B.e.e.”UK Partners for electronic business” (UKPeb) provides this for most aspects of electronic business. The Partners and their main areas of expertise in public and private value chains are given on the final page of this publication. They welcome your questions.

B.e.e. - The Future for Electronic Business

1. Introduction

Electronic business is the combination of working environments, business and administrative processes, data, computers and networks which allows individuals, teams and organisations to collaborate cost-effectively in order to achieve shared objectives, irrespective of the location or ownership of the people, resources and facilities employed.

The principal objectives for enabling business electronically in all sectors of the economy are:-

- To improve speed and certainty of response to the needs of customers and consumers, by linking all relevant parties and by marshalling all resources in an integrated manner to serve end users.
- To enhance the agility of organisations to restructure well as changing conditions and opportunities demand.
- To reduce the total internal and external costs of operation.
- To achieve powerful synergies from individuals and teams being able to work together well and creatively across functional and organisation boundaries.
- To improve competition by linking potential buyers and sellers more cost-effectively.

2. Value Chains

It is helpful to relate B.e.e. powerfully to the concept of value chain management. A value chain (or value network) is the combination of internal and external resources needed to achieve the objectives of an organisation in any public or private economic sector. Through focussing on where value is added as well as on reducing cost, uncertainty and delay in relation to overall objectives, net added value can be maximised.

Value chain management aims to optimise speed, certainty and total cost through a process of simplification and standardisation of overall business and administrative processes (see 'KISS' ref.1). It focuses on shared objectives among all the value chain participants, encouraging co-operation and collaboration, which are manifested by joint processes and data transparency and enabled by shared electronic working environments.

The more simple and standard the new joint processes become, the greater the degree of speed, certainty and total cost improvement that can be achieved and the easier and more beneficial it becomes to apply electronic business. Using electronic business to support existing, diverse and fragmented processes is unlikely to be profitable. However, B.e.e. applied to more simple and standard shared processes maximises the degree of speed, service and cost improvement that can be achieved – a virtuous cycle. Process improvement precedes electronic enablement, but only realises its full potential through the application of e.business.

3. The benefits from Business enabled electronically

The key areas where B.e.e. can provide most potential benefit relate to intercommunication among the participants in a value chain, to improved business processes, and to sharing and using structured data within a shared system of communication.

1. Bringing together all those who are of current and potential importance to an organisation
 - customers, buyers
 - suppliers, sellers, contractors and sub-contractors
 - agents, transporters, financiers
 - authorities, inspectors, information providers

- end-users, employees, teams, consumers, clients, patients, citizens, claimants, communities

The key advantages of B.e.e. come from it enabling these **participants** in an organisation's value chain to –

- a. communicate in both directions, share knowledge, information, skills and experiences
- b. create new markets in which to buy and sell
- c. work within improved joint processes which will improve lead times, costs, capacity utilisation, uncertainty, and related expenses such as write-offs and waste
- d. share structured data which is relevant to the management and performance of the value chain
- e. process and action data automatically instead of via costly manual intervention

These participants can be linked wherever and whenever, in a formal office, at home, on the move or in any other relevant environment.

2. Introducing more cost-effective ways of doing business, i.e. **better processes**. B.e.e. supports the review of internal and external processes to enhance speed, certainty and cost of operation. The development of improved processes should precede the widespread application of B.e.e. (see Section 11)
3. Sharing and using timely and accurate **standard data** (See Section 13) on activities and performance so that all key participants in a value chain can respond in an integrated and supportive manner. In this way, functions and organisations are encouraged to use data transparency to minimise the adverse effects of people and groups adopting a 'silo' mentality through focusing only on their individual benefits rather than on the achievement of shared objectives. If B.e.e. is well implemented and supported, new levels of co-operation and performance can be achieved that would not be practicable without its

support. The corollary is that B.e.e. will achieve little without the sustained willingness to collaborate. (Ref 2).

4. Pre-requisites for successful B.e.e

The application of B.e.e. will bring varying degrees of benefit to organisations and their value chains depending on the following factors:-

- (a) the willingness of individuals and groups to change their ways of working or behaving, their degree of collaboration, their sharing of information and their responsiveness to new joint measures of performance. Such changes in behaviour usually take a great deal of time and effort to achieve, and require ongoing reinforcement.
- (b) The number of participants in a value chain (consumers, customers, suppliers, individuals, teams etc.) who are inter-linked via high-speed, low-cost and easy-to-use communications facilities. Computer facilities which take a lot of time to access and operate will not be much or well used. It is essential to establish the types of communication required for effective B.e.e. use by each type of user, and to define when and at what costs these will become available.

Most homes and offices, for example, currently only have low-speed access to the Internet. This may substantially limit how data, pictures and sound can be presented and used. Furthermore, many Internet and other computer network services are unlikely to be accessed by people if a charge is made (i.e. they are felt to be a 'free good').

Therefore the cost has to be recovered by some other means, such as in the price of goods and services being bought or sold or via advertising – and these may not be easy to achieve. Organisations need to look at the total costs and timescales for access and use, including upgrading networks, software and devices to achieve compatibility, security and performance. It is essential for those intending to apply electronic business to analyse these matters realistically.

- (c) The number of transactions or exchanges of data which take place. The greater the number of transactions and/or communications, the

easier it is to reap the benefits of improved average speed and accuracy. This relates to the numbers of customers, suppliers, and items bought and sold.

- (d) The availability, relevance and accuracy of data. It is essential that organisations invest in cleaning up and standardising their data before, or at least in parallel with, implementing electronic business (see Section 13). Most organisations have much to do to improve the quality of their data. Communicating data which is not accurate or timely, or is inconsistent with data used by value chain partners, will add errors, delays and costs to the operation of any value chain and its constituent organisations. This also requires the standardisation of product and location identification, e.g. via EAN/UCC Codes etc.
- (e) The availability of high quality and well-experienced staff to redesign processes, to restructure and manage value chains, to improve the quality and consistency of data (and especially master data) and to support the above with relevant, secure and cost effective hardware, software and related facilities.
- (f) An acceptable degree of security for communicating, accessing and sharing data.(see Section 12).

5. **Key focal points for B.e.e.**

Businesses and organisations in the private and public sectors are likely to gain most benefit from enabling their business and administrative processes electronically in the following areas of collaborative working:-

- (a) *Improved value chain operations*
- (b) *better management of major projects*
- (c) *more focused and comprehensive communications with end users*
- (d) *streamlined administration and accounting*
- (e) *efficient market-making*

Each of these aspects of B.e.e. will now be reviewed.

6. B.e.e. for Value Chain Operations

KEY DATA - enabled by e.business

- Service levels required at each stage + Actuals achieved
- Planned Sales, Deliveries, Consumer Purchases and Use + Actuals, therefore Accuracy of Demand Plans
- Consumer Complaints - end user reactions
Planned Production, Despatches, Movements + Actuals, therefore Accuracy of Supply Plans
Planned Inventory Levels at each stage + Actuals
Capacity utilisation - Plans and Actuals - performance levels - waste
Master Data on Products, Services, Customers, Suppliers, Agents etc.
Financial Data

COMMUNICATIONS

Direct, via network or Internet, via e.marketplace or e.exchange, EDI, catalogues, via customer or supplier systems

OTHER PARTICIPANTS

Insurance Companies

- Customs - imports/exports

Transporters - Freight forwarders

- Authorities - Health & Safety inspections

The key objectives in running a value chain (or supply chain or logistical network) (see Diagram 1) are to achieve a high level of customer service (and therefore high sales where there is marketable product) at a low total cost. Where organisations (customers and suppliers) do not share accurate and timely data and solely communicate by sending orders and invoices to each other 'out of the blue' 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 levels of waste and write-offs
- More errors in data about products and services, and about buyers and sellers, resulting in the wrong products being ordered, delivered or invoiced, and payments being delayed
- Higher resource and operational costs because of the above

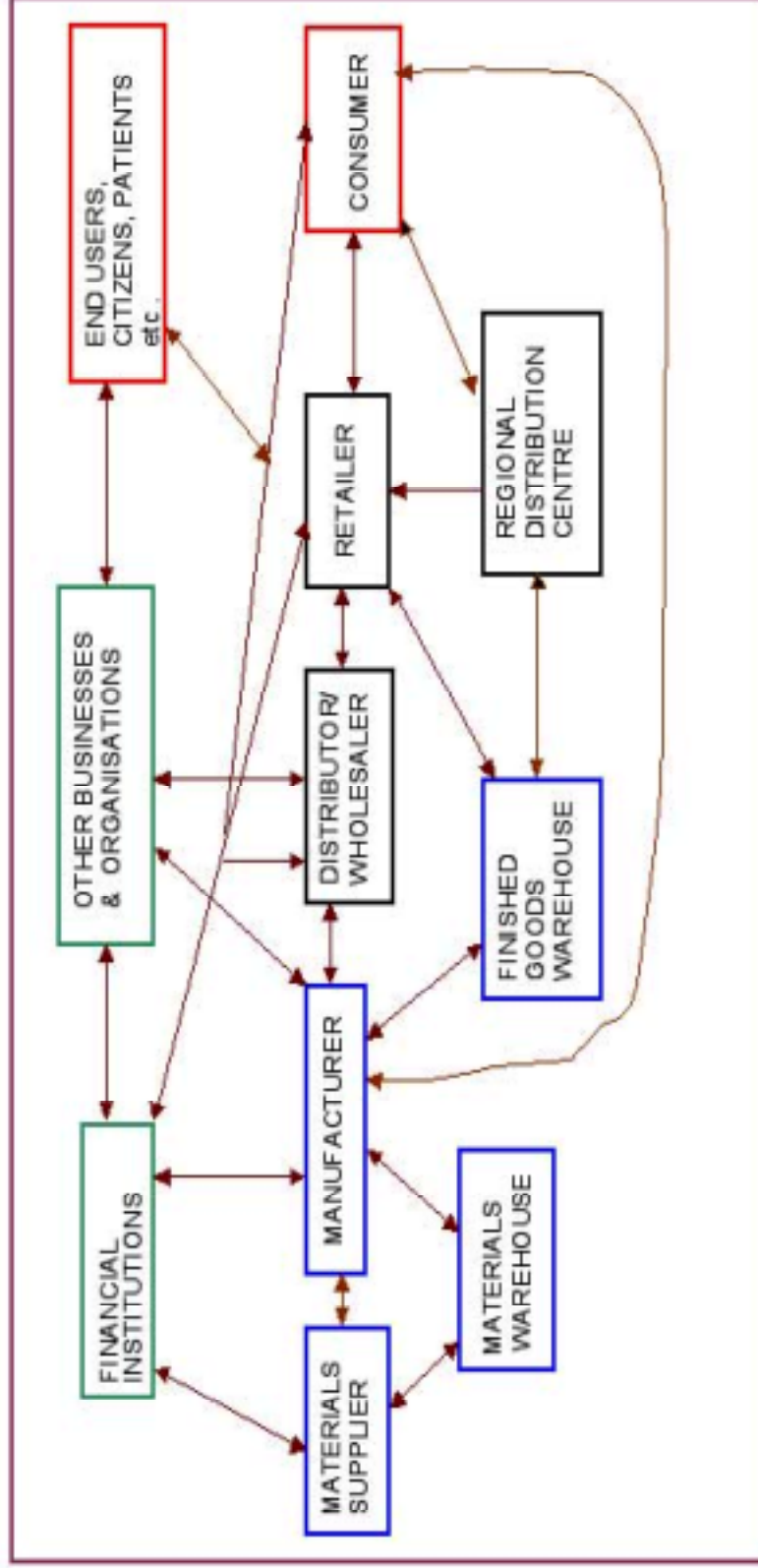
Only by sharing data well across a value chain can all parties be sure that they are responding to the same market stimuli and not to particular or even misleading interpretations.

Effective management of a value chain requires both the management of events, changes and key projects, and also ongoing operations. The types of uncertainty caused by both of these need to be understood.

There are many examples from different industries of how uncertainty increases rapidly across a value chain when each participant

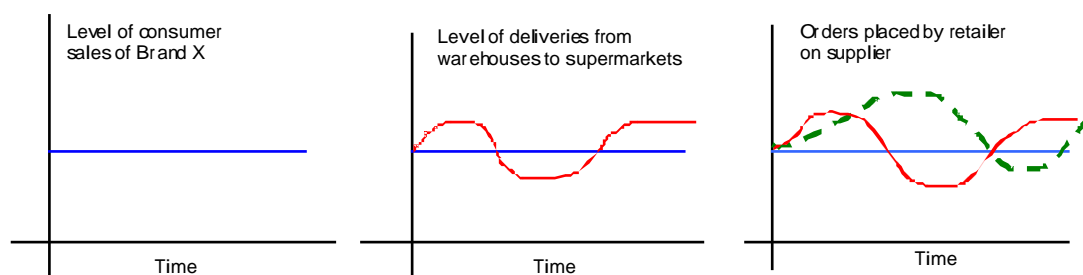
DIAGRAM 1

B.e.e. FOR VALUE CHAIN OPERATIONS



communicates with his suppliers solely by sending orders whenever stock levels become too low. For example, consumer sales for Brand X could be steady in the supermarkets (see below – Diagram 2). 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 suppliers 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 value chain behave as “silos” inhibiting collaboration and transparency of information, unpredictability grows across that chain in relation to the number of participants.

DIAGRAM 2



(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 supplier has been the order from his customer. The supplier 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 this “ Forrester” effect are in reality unpredictable, and also because when a new product goes on sale, or an existing product is sold in a new way, these are unique events and therefore are substantially unpredictable. However B.e.e. enables a rapid response to actual demand.

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

- (a) Real consumer demand, eg. electronic point of sale data communicated automatically to suppliers 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 parts of industry, e.g. telemetry directly from raw material silos to suppliers.
- (b) Why orders might vary at times from this level for operational reasons – eg. shortage of storage or transport capacities and/or high levels of sales of other products. Therefore forward intentions to order (or not), move, receive etc. should be shared.

Using B.e.e. 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 B.e.e. to reduce uncertainties among business partners and their various functions.

- Sales, deliveries, movements – actual and planned
- Inventory levels for materials and/or finished goods – actual and planned (such data should not be shared if customers are going to compete for scarce inventory by sending unrealistic orders).

- Production and distribution – planned and actual performance
- Available capacities for production, distribution and storage
- Financial payments and receipts and associated prices
- Most importantly, where practicable, real end user demand and use.

(See Diagram 2)

No two value chains will require to share 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. Reviews will be required of such factors as:-

- Time buckets for plans – e.g. hourly, daily, weekly, monthly - sufficiently small to ensure responsiveness and the reduction of inventory levels
- Batch sizes for production, changeover times for equipment to make different items, plus the frequency of production or supply of each item. The design of value chain facilities to promote flexibility at a low total cost needs to be fostered.
- Accuracy of master data on products, services, customers and suppliers – so that the correct products are ordered, delivered and invoiced.
- Skill levels and motivation of planners and other key value chain participants, as well as buyers and sales people.

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 events are difficult to prepare for, since demand, and often supply, are unpredictable. Forecasting is very difficult; but 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

e.b. Role Model for Event Management (simplified)

DIAGRAM 3

TIMETABLE	CUSTOMER FUNCTIONS					PROCESS STAGES	SUPPLIER FUNCTIONS					
	MARKETING	FINANCE	LOGISTICS	OPERATIONS	BUYING		SALES	LOGISTICS	MARKETING	MANUFACTURING	FINANCE	BUYING
- 1 year	x	x			x	Agreement to Conduct Business - Define terms of trading - Sign Contract	x		x		x	
- 9 months	x		x	x	x	Agree product - design - specification - recipe - packing - costs	x	x	x	x	x	x
- 8 months			x			Define Outline Master Data		x		x		x
- 6 months	x		x	x	x	Agree Launch Plans	x	x	x	x		
- 70 days						Provisional Contract for Materials				x		x
- 42 days			x	x	x	Confirm Sales Plans	x	x				
- 35 days			x			Confirm Production Plans - Inventory Plans		x		x		x
- 32 days						Deliver Materials		x				x
- 28 days	x		x	x	x	Confirm Marketing Plan	x		x			
- 28 days			x			First Manufacture				x		
- 21 days			x			Ship Product to Finished Goods W'house		x				
- 14 days			x			Product in Regional Distribution Centre		x				
- 7 days			x			Synchronise Master Data on Products and Trading Date		x				
- 3 days				x		Product at Point of Sale						
Day 0				x		Product Launch						
+ day 1 on			x	x	x	Measure Sales	x	x				
+ day 3 on	x	x	x	x	x	Revise Sales production, supply and Distribution plans	x	x	x	x	x	x

consumer purchases and usage) and to further changes to plan are to be handled. Diagram 3 illustrates this. All functions in each customer and supplier organisation need to agree when each decision has to be taken, by whom, and what data are involved, in order to achieve success on launch day. Lead times need to be realistic, and changes need to be communicated and managed systematically.

B.e.e. 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 customers and/or suppliers. 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 'uncomfortable' to introduce. Consequently, and yet again, the successful application of such elements of B.e.e. 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 and company success.

7. **B.e.e. 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 B.e.e. 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 customer and supplier.

The key B.e.e. facilities required relate to:

- Project Strategy – agreement on how the project is to be managed, on joint processes and relationships
- Project Definition – agreement among customers and suppliers 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 Section 6 above) – in total and for each ‘chunk’ (devouring the major project ‘elephant’ in bite-size chunks)
- 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 is also formally assigned to a specific party, including the responsibility for risk mitigation.
- Collaborative Working – shared working environment, including e.mail, workflow, document management, and records management. This can begin simply and evolve to a high degree of sophistication. Shared or Collaborative Working Environments (SWE’s or CWE’s) are fundamental to support all these B.e.e. 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 (which began over 40 years ago), 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 leading to costly changes at late stages of implementation.

- Tendering and Contracting – e.auctions where appropriate, e.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 B.e.e. 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 B.e.e. 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 B.e.e. 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.

8. B.e.e for end-user Communications

B.e.e. 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, B.e.e. 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 e.b. can be consumers, customers, 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 e.b. can be profitably applied:

<u>QUESTION</u>	<u>ISSUE</u>
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. (Providing an interactive musical encyclopaedia, for example, with words, pictures and sound is expensive and cannot yet be accessed by most homes). Can your data and B.e.e. 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. (Compare this with putting an

advertising billboard in a forest and telling consumers to visit it. Better to locate it at Piccadilly Circus or at a football stadium).

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 e.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 customers already have accurate data on what

they wish to order, they should automatically transmit their orders rather than complete them on Internet screens. If customers 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 B.e.e. 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. NB, as an example, processing, picking, checking, transporting and delivering orders for fresh, chilled, frozen, ambient and canned food is highly complex and expensive. New supply chains are neither easy nor inexpensive to develop. They are nonetheless desirable, and even perhaps inevitable, eventually.

9. Last, but not least, can I make a

There are no magic solutions from

profit or ensure that my benefits exceed my costs?

B.e.e. Nevertheless, there are major and unique opportunities. Wise and focused investments should be used to stimulate learning by doing.

9. B.e.e. for Streamlined Administration and Accounting

One of the great areas of potential for B.e.e. 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 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 supplier 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 customer's staff on the supplier's own computer system, and also to do the detailed accounting for each transaction. The customer could then interrogate the supplier'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 suppliers are usually best placed to provide data on their products and services. Do not duplicate what your suppliers should already have done well unless clear value is being added. Certainly ensure that your data are not in conflict with your suppliers' data. It is vital to ensure that your suppliers 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 supplier by the customer, or direct debiting of the customer's account by the supplier, and financial summaries from supplier to customer 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 B.e.e.

10. **B.e.e. for efficient Market-Making**

B.e.e. provides a great opportunity to improve markets for buying and selling. It supports communication with more potential customers and suppliers, and enhances speed and certainty of determination of prices and volumes. It therefore, according to classical economics, improves information, competition and establishes 'better' prices. B.e.e. 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 B.e.e. for market-making are:-

- (a) e.auctions – there are various auction types that can be conducted electronically, e.g. conventional, reverse, Dutch. 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 suppliers 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. e.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 e.exchanges would be well advised to review the history of electronic financial markets.

Improved competition can result in significant reductions in prices quoted. New suppliers 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 e.market-making to obtain a sound understanding of what works well before committing to a major investment.

(b) e.tendering

Whilst there are similar pre-requisites to those for e.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 suppliers. 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-

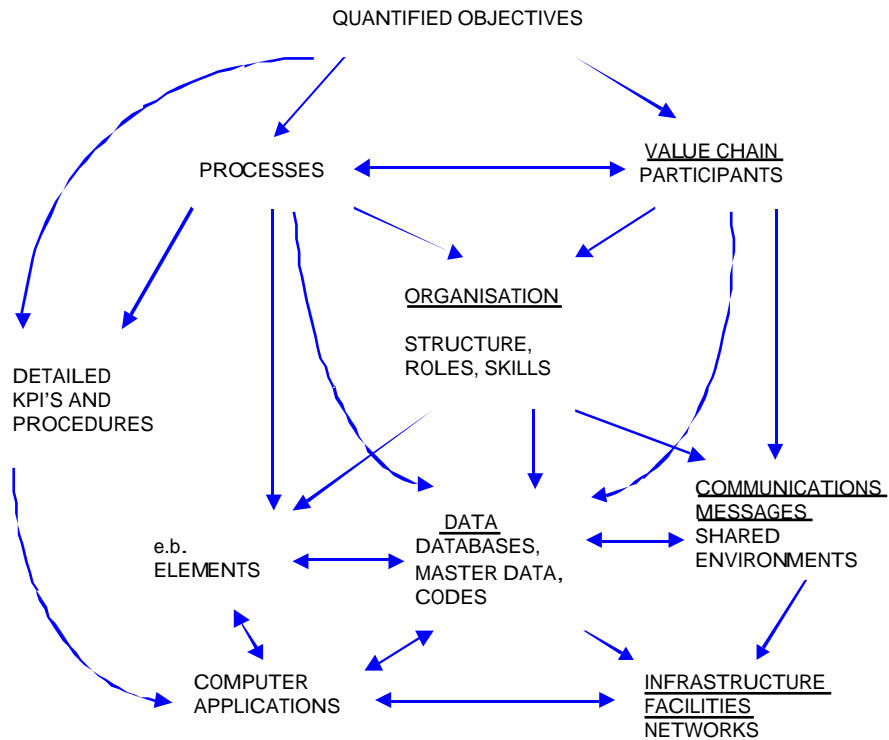
making, (as well as the idiosyncrasies of buyers). Electronic business can enable more common and easy-to-use processes thus reducing the costs for all parties, and thereby encouraging more potential suppliers to participate. Better use can be made of buyers' time by restructuring buying processes and enabling them electronically.

11. **The Sequence of B.e.e. and its key elements**

Ideally, the **sequence** of decision taking is:-

1. Quantify objectives
2. Define required business processes and their associated value chain and participants to achieve these objectives
3. Define the organisation to manage the processes and value chain
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

DIAGRAM 4

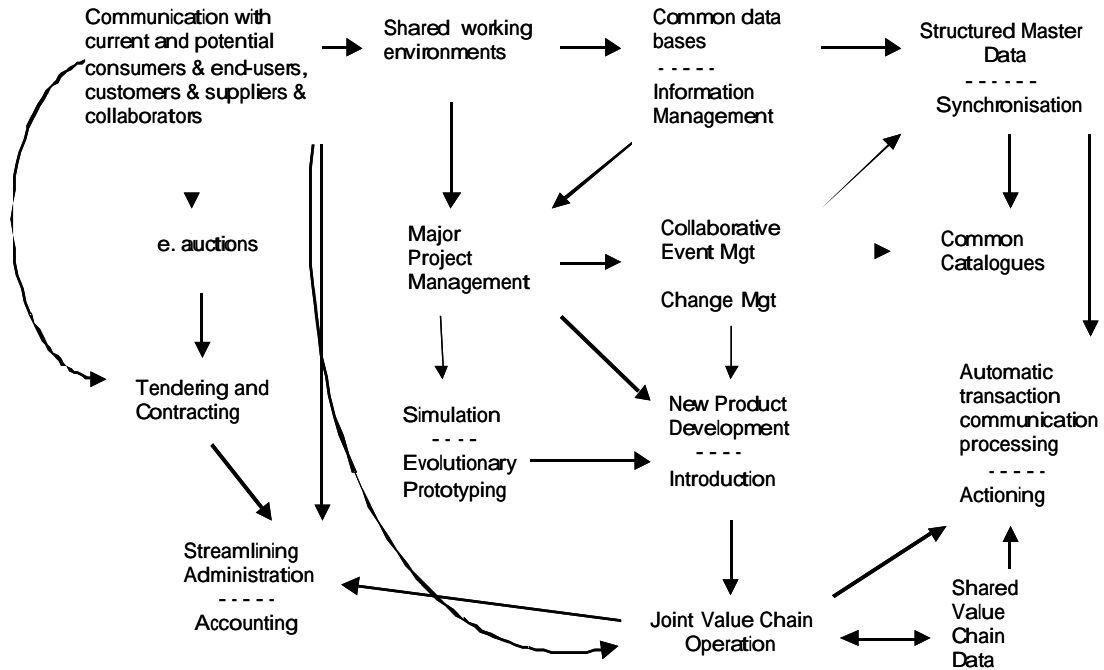


In reality, given existing organisations and computer systems, an iterative programme is needed to establish the most cost effective business processes. Nevertheless, it is vital to bear in mind the desired sequence illustrated in Diagram 4. Applying electronic business or computer packages to unreconstructed processes, or implementing new organisations before redefining processes, are likely to be unsuccessful. It is also important not to confuse the fundamental business and administrative processes with the detailed procedures which support these.

The general relationships among the key elements of B.e.e. are illustrated in Diagram 5. This also shows some possible sequences of implementation and potential pre-requisites.

DIAGRAM 5

KEY ELEMENTS OF B.e.e.



The main alternative locations for B.e.e. are shown in Diagram 6.

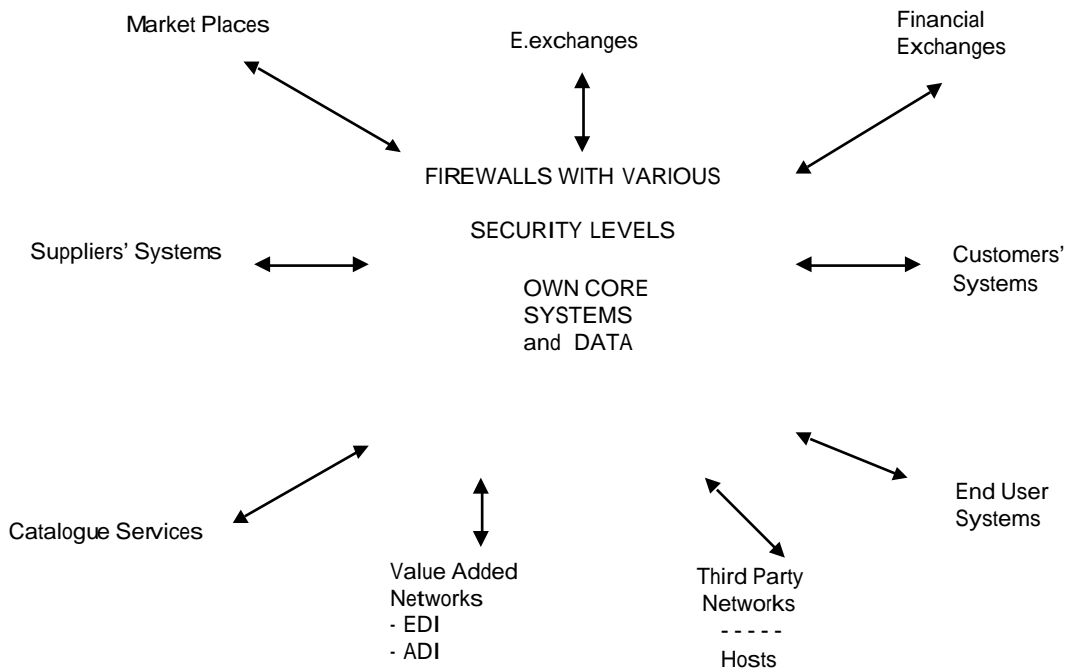
One of the most valuable features of B.e.e. is that it allows considerable choice in where data are to be held and to be processed - in customers', suppliers', or third party systems including e.exchanges, as well as in one's own. It is therefore vital to calculate the alternative total costs and benefits, and also to ensure that data remain standard wherever held. Businesses also need to compare the costs of doing electronic business for differing volumes of transactions. What is a relatively low cost per transaction for a few transactions may become a relatively high cost per transaction for bulk files. In B.e.e. we are always trying to communicate, process and action as much data automatically as is cost-effective (Automatic Data Interchange – ADI). Human intervention needs to be limited to activities where people add genuine net value.

Common standards for B.e.e. are discussed in Sections 13 to 16. Clearly data held in any system must have cost-effective security. Trust in one's value

chain partners and their systems becomes particularly critical when data are moving outside one's own business boundaries.

DIAGRAM 6

LOCATIONS OF B.e.e. DATA APPLICATIONS AND PROCESSING POWER



12 Security and Trust

B.e.e. will not be successful unless the participants have confidence in the security of the communications, and unless they trust all those who have access to their data and who can affect the performance of their business processes. It is essential that expert advice is taken to protect electronic business facilities and data from both malicious and accidental damage, which can come from both internal and external sources.

UKPeb Partners are a valuable first port of call for security advice, and also for related legal and dispute resolution matters.

Mechanisms such as Public Key Infrastructure (PKI) which assist organisations to know that a message has come directly and untampered from a known source, encryption, virus protection, access control, etc. need reviewing with the appropriate authoritative body. Similar steps need to be taken to support continuity of operations in the event of the non-availability of customers', suppliers', and third party systems and networks. This includes external and internal disaster recovery.

The most sensitive security matters usually relate to –

- a) Protection of internal computer applications and key data, especially master data.
- b) Dependability of systems supporting daily operations – e.g. order processing, distribution, production, supply, receipts and payments, (all transactions which relate to the movement of funds are especially sensitive)
- c) Individual data protection relating to consumers, customers, suppliers, employees, citizens, etc.
- d) Data on prices and costs - many companies are happy to have their product description data on public catalogues with the exception of special prices and discounts for individual customers, for which alternative arrangements have to be made to enable direct, private communications.
- e) Shared Working Environments which contain detailed technical specifications for products, designs, recipes, bills of materials, etc. are especially sensitive. The electronic sharing of product-related data needs to respect Intellectual Property Rights. Trust therefore needs to be embedded within rigorous security procedures.
- f) Links with banks and financial institutions.

It is therefore essential that electronic business facilities are reviewed across the value chain. Firewalls and other security features need to relate to the business risk involved in a cost-effective manner. Security issues should not be used as a reason for not progressing with B.e.e.. Nevertheless,

security needs to be tackled seriously, systematically and professionally. Using B.e.e. wisely to automate communications can also be an effective way to improve overall business security.

13 e.business standards and master data

Business people have grown increasingly frustrated since the first computer was introduced because each new type of technology seems to require them to spend a great deal of money changing their hardware and/or software. The first computer (and the latest technology) produced great excitement. The second computer (and the existing technology) caused all the problems, because of its 'incompatibility' with the first. Clearly there is no end in sight to technological improvement. (Thus the Internet is "only" one part of the spectrum of electronic communications, however revolutionary it is, and it is not the end.) Since e.business **enables** improved, collaborative business processes across any value chain, should not these agreed, new processes be protected from, and yet served well by, advances in technology?

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 have we been told that a new Information Technology, such as the Internet, (or Open Systems Interconnection, or 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 customers and suppliers 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. (We first proposed this in the TRADACOMS EDI Standards in 1982, but too few firms have so far modernised themselves sufficiently to implement this well). The detailed information on buyers, sellers, products, services and other master data are then linked to the transactions by standard identifying codes. Transactions are therefore simpler, more accurate and quicker (and easier) to process and action.

Master Data – 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 with each other via standard, global numbering systems, such as EAN/UCC. This EAN/UCC Numbering System is relatively straightforward to administer, and it guarantees global uniqueness without ambiguity. It has excellent support in both e.business (EDI and XML) and Automatic Data Capture (Barcoding and Scanning and Radio Frequency Tagging – the ‘chipping of Goods’).

- Value Chain Participants are identified using **Global Location Numbers** – GLN (formerly known as EAN Article Numbers)
- Products and Services are identified using **Global Trade Item Numbers** – GTIN (formerly known as EAN Article Numbers - global except North America) and UPC Codes (North America)
- Assets are identified using **Global Individual Asset Identifiers (GIAI)** and **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 B.e.e. (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 companies' 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 supplier's system – the supplier should be best placed to provide accurate data on his products and services.
- (b) On the customer's system – it may be most appropriate where there is one key customer and many suppliers for the customer to copy data across from suppliers' systems
- (c) On third party servers or value added networks – industry catalogues
- (d) On electronic market places or exchanges

(See Diagram 6)

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 making full use of 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.

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.

14. Simpl.e business Standards

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**.

SELLER/
SUPPLIER

BUYER/
CUSTOMER

GLN Code

GLN Code

ORDER REF. NO.

DELIVERY
LOCATION

DELIVERY
DATE

ORDER TYPE

GLN Code

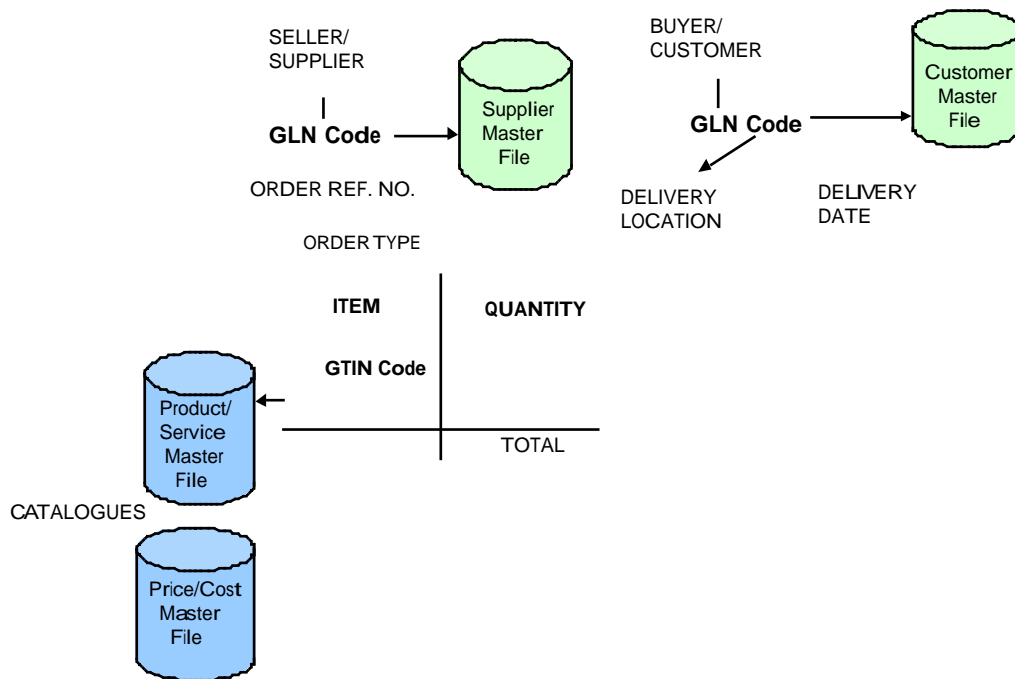
ITEM

QUANTITY

GTIN Code

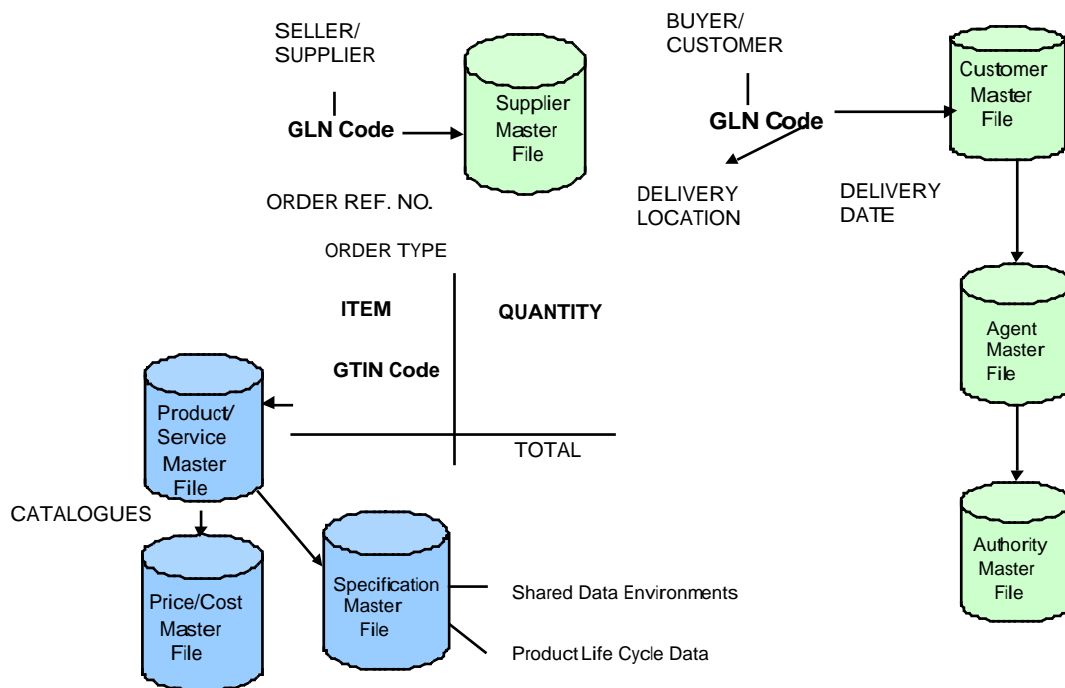
TOTAL

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/ADI transmissions of master data, or by using a shared electronic catalogue somewhere on the network, or in a supplier's application.



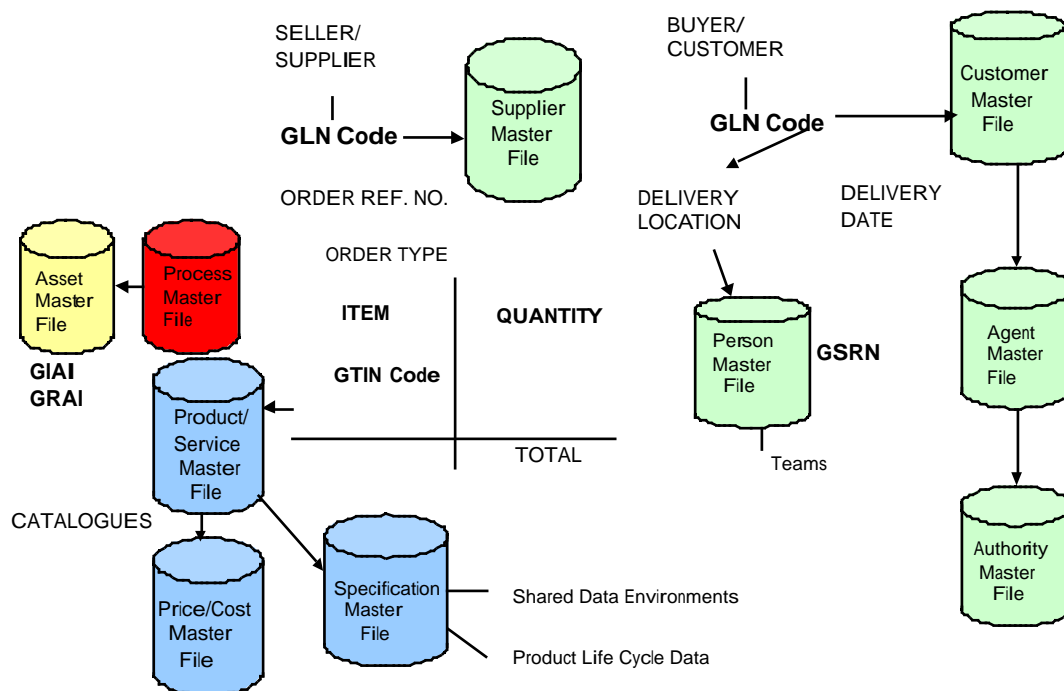
More complex transactions may also involve a third party **Agent**, such as a transporter, a bank or an insurance company, eg. for an export or import. Such a transaction might also involve an **Authority** such as Customs, or an Inspection body. Some transactions involve **Individuals** who may be employees, 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'.



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).



Simpl.eb standards are independent of the technology. They can be expressed in a standard way to support Internet communications via XML or automatic data interchange (ADI or EDI) via 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 into EAN/UCC (for e.b and product identification) .

15. Key Value Chain Messages

Very many value chain messages can and should be covered by the Simpl.eb principles. The same data elements should be employed in all these messages, with the same sequencing and logical distinction between transaction and master data. Forward plans and past performance data can

easily be encompassed within the same logical structure. A plan is a future intention to do, to order, to produce, to deliver, to sell, to treat. Performance data represents past actual deliveries, production, sales, treatments etc.

PLANNING & PERFORMANCE DATA

T (	<u>ORDER</u>	Deliver	Process)	<u>PAST</u> -	<u>PRESENT</u> -	<u>UNFULFILLED</u> -	<u>FUTURE</u> -	<u>specific</u>
R (		Move	Treat)	Completed	Action Now	Incomplete	Intention	<u>dates</u>
A (		Produce	Cook)	Actual			Plan	<u>time</u>
N (		Pay	Service)				Provisional	<u>periods</u>
S (
A (	<u>INVOICE</u>	Debit	remittance advice					
C (		Credit	statement					
T (		Statement						
I (
O (	<u>INVENTORY</u>	point						
N (		average						
S (

<u>MASTER</u>	Buyer/Customer	Product	Process	Asset
<u>DATA</u>	(location)	Price/Cost	Treatment	
	Seller/Supplier	Specification	Recipe	
	(location)			
	Agent			
	Authority			
	Individual			
	Team			

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, and only communicated on a “need-to-know” basis. 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. More details on all the above developments can be had from e.centre.

16. Other key standards

e.business in the Banking world is supported for example, by the SWIFT standards which relate to international payments. There are also many

security standards relating to payments and to individual identification. All such standards are supported in the UK via APACS.

International Trading Standards are supported by SITPRO in the UK, including the representation of the UN.TOPFORM trading documents in Web form via ElecTra. This allows accurate trading documentation to be prepared and communicated to all key points in the international trading value chain with maximum likelihood of acceptance and fast clearance of goods. UN.ECE are incorporating ElecTra into UNe.Docs standards.

Great developments have taken place in the area of standards for collaboration among organisations developing complex products such as machinery, construction projects and defence platforms, weapons and communications. These include the ability to design, develop, implement, upgrade and decommission products – from birth to death.

STEP standards (for Product Model Data and Product Life Cycle Data) now cover such areas as:-

- i. Configuration Controlled Design of Mechanical Parts
- ii. Associative Draughting
- iii. Process Planning using Machining Features
- iv. Finite Element Analysis
- v. Printed Circuit Assemblies
- vi. Wiring Looms
- vii. Mechanical Design
- viii. Construction projects
- ix. Composite and Metallic Analysis and Related Design
- x. Electronic Assembly, Interconnect and Packaging Design
- xi. Electro-technical Design and Installation
- xii. Core Data for Automotive Mechanical Design Processes
- xiii. Bundling Elements using Explicit Shape Representation
- xiv. Plant Spatial Configuration
- xv. Product Life Cycle Data

These standards are supported in the U.K. by UKC.eB

International standards for many technical and communication matters are overseen in the UK by the British Standards Institution.

Best practices in B.e.e. for Industry, notably for smaller enterprises, and also for Government to Industry, are overseen by the Department of Trade and Industry. The DTI also provides guidance on how to get started in e.business.

Government to Government and Government to Citizen communication standards are under the aegis of the UK e.envoy.

All UKPeb Partners co-operate to ensure that standards are developed once and well and that information on standards and best practice is effectively shared. The Partners also act as the linking channels with the international standards community, e.g. ISO, ITU, IEC, UN.ECE (CEFACT), EAN/UCC, etc.

17. The Paradoxes of e.business

e.business has little value in itself. It **enables** organisations to undertake activities more quickly and effectively, but the activities and processes need to be sound. It **enables** organisations to come into direct and interactive contact with new customers, suppliers and other value chain partners, but all these have to be ready and willing to participate and collaborate. It **enables** data to flow more quickly to wherever it is needed, but the data must be accurate and relevant. Computer applications need to be capable of receiving and processing the data automatically, and organisations need to put in place resources to action the results.

B.e.e. promotes more **competition** by allowing more buyers and sellers to participate in a market, eg. via e.auctions, or electronic catalogues, or Web sites. B.e.e. can help to reduce prices or increase sales in the short term, but substantial additional actions are needed to ensure that it enhances service, performance and total cost in the longer term.

Developing and implementing joint value chain processes, standardising data messages and computer applications, and sharing data across a value chain to support joint activities, all require a large amount of time, effort and **commitment** by all parties. This in turn will only take place if suppliers and customers believe that there is a longer term willingness to work together, and that they will not be 'auctioned' out of business at short notice. Organisations may feel that it is easier to order when required rather than to make the effort to introduce joint decision taking processes with suppliers. They may feel that it is too much trouble to use the same accurate data for internal and external communications. Such easy ways out do not work when implementing B.e.e.

Hence B.e.e. fosters **competition** but also requires sustained **collaboration** to yield all its benefits. It is therefore essential that a proper balance is maintained between sustained joint improvements to value chain management **and** healthy competition to develop new products and services, which will in turn become successful and profitable more quickly via these restructured value chains, well **enabled** by e.business. (Ref 2). Company cultures, organisations and reward mechanisms need to support the achievement of this balance.

A further paradox of B.e.e. is that while it fosters communication and participation by all current and potential 'members' of a value chain, it encourages the maximum automation of data communication, processing and actioning. That is, every individual can be involved in B.e.e. if they have access to a networked computer. But, speed, certainty and low total operational costs will only be achieved if individuals focus on tasks to which they add real value, while most data is automatically verified and passed from one computer application to the next across the value chain without intervention (Automatic Data Interchange – ADI).

Electronic Data interchange (EDI) has encouraged this for the last 20 years, although too many organisations have failed to standardise their data. As a consequence they have had to print out and re-key messages sent to them or have had to maintain expensive data cross-reference tables.

All profitable electronic business (whether or not it uses the Internet, or is EDI/ADI) requires a commitment to common processes utilising accurate shared data.

18. Preparing well for e.b.'s future roles

It will be evident from the above that all organisations need to look afresh at the following:-

- (a) what are their quantified objectives? Are they shared across the value chain by all participants?
- (b) What is the most appropriate value chain that supports these objectives?
- (c) What is the most simple and standard set of processes which will support the value chain operating at the required speed, certainty and low total cost?
- (d) What organisational structure, skill sets and experience best supports the operation of the processes? What functions, what coordination of value chain management, and what reward mechanisms are needed?
- (e) What elements of business are going to receive most benefit in the short, medium and longer terms from e.enablement? e.g.
 - Value chain operational support
 - Major project management
 - Change management
 - Communication with end users, citizens etc.
 - Streamlined administration
 - Market making, including tendering and contracting
 - Education and training

What will B.e.e. add better than alternative means, and how will B.e.e. sustain and enhance service, competitiveness and agility?

What are the examples of best practice?

- (f) How can early, low cost trials be conducted to highlight the opportunities and issues, benefits and costs? What support is needed to achieve success in these trials?
- (g) What facilities and infrastructures are required, and how can these be provided in a dependable, low cost and secure manner?
- (h) How can effective collaboration be achieved among individuals, functions and organisations across a value chain? Promotion of a

culture of trust, transparency and joint working is vital, while at the same time fostering positive competition.

- (i) What data need to be standardised and managed across the value chain, and where should they be located. It is especially important to review data bases, master data, transactions, messages and coding systems.
- (j) Last, but not least, how and when will a satisfactory return on investment be achieved?

It is evident that implementing electronic business is not a 'quick fix'. B.e.e. will nevertheless support substantially higher levels of performance than would otherwise be practicable, if the approaches outlined in this publication are followed. Now is the time to set the direction for your B.e.e. and to build the business and administrative foundations which will produce the honey.

Acknowledgements

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I am increasingly grateful to my family of B.e.e. experts – Iain, Catriona, Douglas (who also designed the B.e.e. cover) and Alison, excellently led by my wife Sheila.

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by Tom McGUFFOG –
published by e.centre uk 1999
2. 'A Vision of the Future Value Chain'
published by A.I.M. 2001
3. For details on Web-enabled international trade documentation
(ElecTra) contact SITPRO

Also, an analysis of the international trade value chain indicating elements of net added value and cost is also available from SITPRO.

Tom McGuffog is Chairman of UKPeb. He is Vice Chairman of SITPRO and a member of the Supervisory Board of e.centre, and is also the UK Head of Delegation to the UN (CEFACT) for trade facilitation and e.business. He is non-executive director of the UK Defence Procurement Agency and Visiting Professor of Business at the University of Glasgow. His executive positions in industry included directorships of Planning and Logistics, Purchasing, Transport and Distribution, Information Technology and e.business at Rowntree and Nestle. He is a graduate in economics of the Universities of Glasgow and Massachusetts. He is a Fellow of the Chartered Institute of Purchasing and Supply, and of the Institute of Logistics and Transport. His involvement in e.business began over twenty years ago, chairing the group which developed the key standards and network for EDI in the UK. He was recently awarded the MBE for services to e.business.



The Partners have a wealth of experience in best practice and standards for e.business to aid your progress. Contact them now for each key e.business topic.

**PAYMENTS & MONEY TRANSMISSION,
SECURITY**

Email: info@e-envoy.gsi.gov.uk
Web: <http://www.e-envoy.gov.uk>

APACS

Mercury House
Triton Court
Finsbury Square
LONDON
EC2A 1LQ
Tel: 020 7711 6200
Email: publicaffairs@apacs.org.uk
Web: <http://www.apacs.org.uk>

**PRODUCT IDENTIFICATION , BUSINESS
COMMUNICATIONS & VALUE CHAIN
MANAGEMENT, LAW**

ecentre
10 Maltravers Street
LONDON
WC2R 3BX

Tel: 020 7655 9000
Email: Info@e-centre.org.uk
Web: <http://www.e-centre.org.uk>

TECHNOLOGY & COMPUTING

British Standards Institution
389 Chiswick High Road
Chiswick
LONDON
W4 4AL
Tel: 020 8996 7358
Email: Jan.Sellars@bsi-global.com
Web: <http://www.bsi-global.com>

**INTERNATIONAL TRADING &
VALUE CHAIN PROCESSES**

SITPRO Ltd
8TH Floor
76 Oxford Street
LONDON
W1D 1BS
Tel: 020 7467 7280
Email: info@sitpro.org.uk
Web: <http://www.sitpro.org.uk>

**GOVERNMENT, TRADE & BUSINESS
COMMUNICATIONS**

Department of Trade and Industry
151 Buckingham Palace Road
LONDON
SW1W 9SS

Tel: Call Centre 0845 7152000
Email: info@dti.gov.uk
Web:
<http://www.ukonlinefrobusiness.gov.uk/first>

**MANUFACTURING,
ENGINEERING & DEFENCE**

UKCeB Secretariat,
1 Gypsy Patch Lane
Filton
BRISTOL
BS34 8LR

Tel: 0870 2402734
Email: Secretariat@ukceb.org
Web: <http://www.ukceb.org>

**GOVERNMENT, CITIZEN & BUSINESS
COMMUNICATIONS**

The Office of the e-Envoy
Stockley House
130 Wilton Road
LONDON
SW1V 1LQ
Tel: 020 7270 3000

GENERAL ENQUIRIES

If the information you are looking for is not here,
you can telephone us on 020 8996 7358 or you can
e-mail us at:

Jan.Sellars@bsi-global.com
where your queries will be dealt with. We will send
you an e-mail acknowledgement, and get in touch
with the right contact for you.
Web: <http://www.ukpeb.org>