Guaranteed electronic markets

the backbone of a twenty first century economy?

Wingham Rowan

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Contents

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Introduction

Point-and-click shopping via computer networks, destined to encroach into all our lives, is already demonstrating its potential. An Internet user seeking a weekend away, for instance, can already compare hire car companies and then book a vehicle in minutes. Accommodation for a Saturday night is just as easy to find: several hotel chains have interactive Net pages which illustrate rooms and allow deposits to be paid by typing in a credit card number. If, however, funds need to be borrowed for the trip, a selection of financial companies will allow the user to enter personal details into an on-line loan application form which their software can approve immediately.

This vision of consumers able to purchase through their screens, down phone lines to central computers, is advancing at speed. Fully fledged home shopping will become available, at low cost, through television sets across the UK when British Interactive Broadcasting is launched in autumn 1998. Substantial cost savings for consumers are likely to make purchasing by TV increasingly popular. Significant social and economic dislocation could result from this trend but investment in the technology has now reached unstoppable momentum worldwide. We stand on the brink of a trading revolution that could be as momentous as the information revolution of recent decades.

But this new era will have a limited number of beneficiaries: only big companies can sell on teleshopping systems; the rest of us can only consume. Internet trade creates potential for small companies to market their wares but, as following chapters will show, it will not offer anything like the advantages that corporations stand to gain from television-based home shopping systems. As economic power continues to concentrate around large companies – with diminishing requirements for staff – inequality and social deprivation are likely to increase. Despite this, it is largely taken for granted that 'the market' must be unrestricted in its rush to build a new trading order. President Clinton firmly established this hands-off approach by government as the world's prevailing orthodoxy with his 'Framework for Global Electronic Commerce', announced in summer 1997.

The alternative to untrammelled commercial development, however, is not necessarily crippling statist control, as many in the computer industry believe. There is a middle way. In this scenario, government takes responsibility for an overview of how the emerging

technology can best benefit the population as a whole and then uses legislation to create the commercial opportunity which will attract companies with the funds and expertise to make that option a reality.

Historically, it is through this combination of official foresight and private enterprise that so many inventions have spread to mass use. Telephones remained little more than a novelty for local conversations until a raft of General Post Office regulations starting in 1880 created the foundations for a national network. A succession of Railway Acts in the 1840s led to the track laying frenzy that brought mind broadening travel to Victorian workers. The impetus for Britain's network of quality roads came not from multiple private and regional projects, which conspicuously failed to prepare for the motor car age, but through the 1909 founding of the National Road Board. In the 1990s, the global zeitgeist is opposed to major regulatory initiatives but electronic trading should be considered an exception because of its enormous potential.

The following chapters focus on this parallel route for the trading revolution. They advocate promoting the benefits of electronic trading technology in the form of 'guaranteed electronic markets' (GEMs). These trade channels, available over the Internet or through interactive television sets, would create genuinely open marketplaces in which anyone can sell an endless variety of goods and services. With this option, a home shopper might hire a neighbour's car to drive to an elderly couple's seaside flat hired for a weekend using money borrowed from a person living 200 miles away. No companies would be involved in any of the deals and the shopper would never have met any of her three trading partners. All transactions would be watertight and fully verified from both sides, with anyone free to enter the marketplace, on their own terms, at any time.

Almost anything could be traded across a GEM. A busy parent could find someone to do four hours of ironing; secondhand photocopiers could be traded between small businesses. Ultimately, many thousands of sectors would be offered, serving both consumer and business-to-business markets. There is negligible demand for these facilities at present because there is so little public awareness of what electronic trade is capable of achieving.

This book demonstrates how international institutions are already harnessing facilities within electronic markets that go far beyond anything already planned for teleshoppers or Internet users. Those functions could be extended to many more sections of society with similar impact: widening of markets, increased turnover for all participants and countless new economic opportunities. The currently poor would be among the first to benefit.

Setting up these markets, which would give every individual and business in the country trading capabilities currently enjoyed by currency dealers, would be an uncertain and politically sensitive process. However, it should be no more daunting than was the building of nationwide canals in the eighteenth century, a rail network 60 years later or a mass phone system after the First World War. All pushed existing technology to its limits in the face of entrenched scepticism from vested interests and had to rely on a sympathetic government

to create the regulatory environment in which new services could thrive. But each of these major infrastructure projects quickly became a vital component of national economic life, turning nascent technology into a genuine public service. The benefits of electronic trading could, likewise, be provided as self-funding national infrastructure.

This book outlines how universal open electronic markets could be set up and what consequences might follow if they were. It opens with an overview of this little understood technology that is now edging towards centre stage.

Electronic trading

past, present and future

Roots of the trading revolution: the travel industry

Beneath Oklahoma's Tulsa Airport is a man-made cavern covering a floorspace larger than that of Wembley Stadium. Inside, within a bomb-proof four feet thick concrete shell, is an array of mainframe computers. So critical is the work of these machines that staff working here must have their identities confirmed by retina scans and weight checks at the start of each shift. In the event of disaster above ground, the complex could survive on its own air, water and power supplies for three days.

This is SABRE, the world's first, and now biggest, electronic ordering system. If a customer tells a travel agent he wants a week in Singapore en route to a fortnight crossing Australia with flights, hire cars and all accommodation pre-booked, it will be SABRE, or a smaller competitor, that the agent's terminal is connected to as she types in those requirements. Moments later her screen will display availability and prices for every component of the itinerary. Pass over a credit card and the whole package, involving multiple suppliers in different industries, will be booked.

SABRE began life in 1959 as a reservations computer for American Airlines, blossoming through the 1960s and 1970s into a complete international travel market that now trades seats for 350 airlines, beds across 190 hotel chains and vehicles for 55 hire companies. With 140,000 terminals sending enquiries from around the globe the high-tech bunker in Tulsa has shown it can process 5,000 messages per second.

For a flat fee of around $3 per transaction, depending on the level of administrative back-up to each deal, SABRE offers the travel industry a highly flexible marketplace. The price of an underperforming product can be dropped or margin on a strong seller increased, in a couple of hours, to customers across the planet. Additionally, SABRE offers its client companies 'decision technologies' whereby data accumulated over decades of operation can be used to plot scheduling and pricing strategies for maximum competitiveness. For years, SABRE was more profitable for American Airlines than their core business, running one of the world's largest airlines. In 1996 it was floated as a separate company.

Despite its volume of trade, SABRE is not a marketplace open to any relevant seller

Planet Sabre

The travel agent's booking display on a SABRE terminal. Click on the mode of transport, then the geographical area to bring up requests for more information. (Courtesy of SABRE Europe)

but a sales tool limited to very large companies. 'If you had just one unaffiliated hotel you would drive yourself silly trying to be listed on a computer reservations system,' says Graham Barnes of Abtech, a travel trade technology project. 'It is not that the systems couldn't sell those rooms, just that it is not their style.' Having set up the marketplace, by virtue of their financial muscle, the major players have assumed they are the market. This is a common theme in the brief history of electronic trade.

The computerisation of high finance

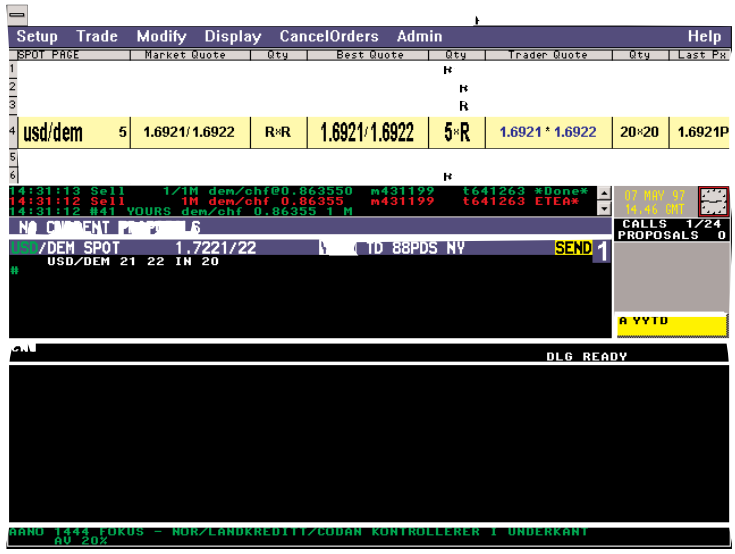
The travel industry regrouped itself around electronic trading during years of globalisation as mass jet transportation took off. In the 1980s, worldwide currency deregulation bestowed similar fortune on financial organisations. They too seized the moment and began to look towards computerised marketplaces for low cost transactions and increased efficiency.

Stock exchanges and futures markets around the world have now given way to on-screen trading, but it is in the instant sale or 'spot' foreign currency markets that one machine has done so much to affect economic planning around the world. Until the late 1980s, currency dealing was a gentlemanly affair involving brokers phoning or telexing trusted counterparts in search of the best deal for their clients. Only a small proportion of buyers and sellers were speculators; most were companies genuinely requiring funds for foreign purchases. Then, in 1989, Reuters launched their computerised 2000-1 on-line 'conversational' dealing system on to trading floors, followed in 1992 by the more sophisticated 2000-2.

The 2000-2 core computer, on Long Island near New York, runs the closest thing the world has yet seen to a perfect marketplace. If a currency dealer in London wants to

buy $100 million and pay in yen he inputs that into his terminal, together with a price at which he will trade. If there are buyers anywhere willing to sell at his price the transaction is done instantly, with the money transferred electronically between accounts. If the best value route to purchasing his US funds is by sourcing the tranche from multiple sellers, the 2000-2 will construct that deal just as promptly. No takers at present? The computer will keep looking. In either case the flat fee is a mere $25.

Spot currency markets were never the same again. Ultra-cheap dealing costs and the potential to respond immediately to any hint of a price movement encouraged traders to buy and sell constantly. Unlike the phone brokers of old, relying on professional trust among a coterie of established banks, traders on 2000-2 can sell with confidence to any buyer presented by the system. If that institution did not have sufficient funds in



Dealer's eye view of the world currency exchanges: a 2000-2 trading screen. (Courtesy Reuters)

their account, the computer would not allow it to trade. This security for sellers snowballed the marketplace into ever increasing turnover among a widening number of players. The ratio of 'genuine need' trades to speculation has reversed, with around 90 per cent of market activity now motivated by nothing more than the hope of a quick killing.

The value of international currency exchange currently equals around 50 times the amount of actual goods and services traded worldwide in any given period. Full-time phone brokers in the mainstream spot markets are now a forgotten breed. But victims of the opportunistic flows of capital unleashed on Reuters' computer extend further than a few financial sector employees. Robert Reich, President Clinton's former Secretary of Labor, told the *New York Times* that 'global electronic capitalism is destroying the investment system under which industrial leaders once took care to balance the inter-

ests of shareholders, employees and the public at large.' As dealers and banks profit from the electronic market set up to serve their needs, we have all paid the price of their new capability.

Other industries are busy building their own electronic marketplaces: plastics and rubber, for instance, can now be traded between companies over the Internet.[1] Meanwhile, Electronic Data Interchange, a protocol for paperless (and increasingly peopleless) ordering between big companies and their suppliers, is being progressively merged with the ease of access offered by Internet sites.

Teleshopping today

Excitement among electronic trading enthusiasts is now focused on its move into the home. Services like Britain's Prestel, France Telecom's Minitel and interactive television trials worldwide have paved a way for fully fledged home shopping services. The driving force is 'convergence': the evolution of telephone, TV set and home computer into one interactive communications device. Immediate applications include video on demand, the ability to call up (and pay for) films or other material from exhaustive on-screen menus at any time. Home shopping uses the same technology, displaying goods for sale and taking orders from the remote control.

Boardrooms in the retail sector are debating the corporate response to this transformation in the way we shop. On one hand, it could be used to scythe through overheads while compiling invaluable data about each individual customer for marketing purposes. But, on the other, the systems will be expensive to set up and key technology and delivery issues remain unresolved. Besides, it is possible that most customers will decide to stay loyal to the mall or high street, where they can browse goods more tan-

Shopping for music on British Interactive Broadcasting: the projected HMV virtual store. (Courtesy BiB.)

gibly. In the uncertainty, many companies are beginning to experiment with electronic trade, if only to start accumulating the knowledge required if they want more committed involvement later.

One company which has decisively taken up electronic trading for consumers is media giant Time Warner. Their Full Service Network (FSN) is currently limited to 4,000 cable television subscribers in Orlando, Florida; it offers an array of services, including interactive home shopping. Any user wanting to order a pizza, for instance, can click round the carousel of options on screen then alight on the Pizza Hut logo. Selection of toppings is followed by pointing to a chosen diameter. The cost is added to a monthly bill. Likewise, clothes, furniture, jewellery, cookware and stamps have all been available to be browsed, paid for and despatched by post immediately.

Full Service Network did not have an easy gestation. The launch was repeatedly delayed by technical glitches and ambitious roll-out plans appear to have been scaled back. But initial efforts are impressive: navigating a potentially bewildering array of services on FSN is straightforward following months of test runs with trial interfaces. The company is adamant that much is being learned – but not shared with anyone else – about behaviour patterns of the new breed of interactive consumers.

A similar service for the UK, British Interactive Broadcasting (of which 32.5 per cent will be owned by Rupert Murdoch's BSkyB), is expected to be launched in autumn 1998. Users will have to invest £200 in a set-top box that will make their television interactive through a connection to a telephone socket. In return they will have access to video on demand and parts of the Internet, plus point-and-click shopping with Sainsbury's, HMV Records, Great Universal Stores (of catalogue fame), Thomas Cook and others already signed up as interactive retailers.

Selling on the Internet

As corporations plan their strategy for a time when interactive television is commonplace, countless smaller enterprises are testing the waters of electronic trade by setting up order taking pages on the Internet. Excitement about commerce over the Net, evangelised by a cascade of books like *How to make your millions in cyberspace* and *Secrets of interactive wealth*, peaked in 1995–96. There is now a sober realisation that, although things will get better, the global web of connected computers does not yet constitute a mass market. Some niche services prosper (book sales, financial products, travel services) but none of the 4,000 or so 'virtual malls' can be considered a success. The Net is still too slow and too unpredictable for many customers. Payment is laborious and insecure: it usually requires typing in credit card details, often for a firm on the other side of the world who may, in reality, be fraudsters posing as a reputable trader.

Despite this disappointing start, merchants offering order-taking facilities to Net users see it as preparation for what lies ahead. 'This is part of a long learning curve,' says

Roger Alexander of Barclay Square, arguably Britain's most ambitious virtual mall, with only a fistful of sales to show for a first year of expensive operation.[2] Less adventurous companies wanting to be involved with this process, but wary of the costs and problems of an on-line presence, can now call on many consultancies offering software 'solutions'. Issues to be solved include payment collection, display design and how to fully exploit data collected about individual customers.

Firms doing this preparatory work now are unlikely to see it wasted. Massive transmission capacity is being added to the phone lines that carry Internet content by telecom providers internationally in a concerted effort to improve its performance. A new protocol for credit card transactions launched jointly by Visa and Mastercard will allay fears over security. Banks and software houses are cooperating on new one-click routines for transferring funds between accounts. Above all, interactive television sets promise access to the new simplified Net to the general public, which has little or no experience of using the new computer technologies.

This race into the unknown is not happening at the comparatively accommodating pace of past social change. Computerisation gurus talk about a seven-for-one rule; one year in the life of on-line developments currently involves sweeping transformations that would take seven times as long in any other aspect of human endeavour. The increasing power of computers, matched by real falling prices for the level of power delivered, is rewriting some of the rules of economic development.

The future of teleshopping: can it succeed?

For retailers, teleshopping promises advantages that are hard to ignore. Outgoings on property are slashed as high street premises give way to a centralised distribution centre. Staff costs tumble; the retail hierarchy can be replaced with a handful of box shifters and labellers, following instructions from a central computer. Goods no longer need to be transported around the country in anticipation of being sold. Instead, they remain on depot shelves until paid for, shrinking the supply chain and enabling swift response to fluctuations in demand. Shoplifting is not an issue.

All these savings can be passed on to consumers; one pioneer interactive shopping specialist, CUC International of Connecticut, claims savings of up to 50 per cent on shop prices.[3] There are display benefits, too. Car accessories can be demonstrated in whatever make of vehicle the buyer wishes. Record stores can offer beguiling clips of music to sway uncertain purchasers. High quality video might show a ready-cook meal in its prepared state.

However, many traditional retailers remain confident that customers will not desert the shops. 'Concern is too strong a word for our view on teleshopping,' says Alan Sayers, Chief Executive of the British Shops and Stores Association. 'We represent a lot of fashion, furniture and textile outlets, and accept on-line ordering is going to take

some market share, but most customers want to feel and touch their clothes or furnishings before deciding to buy.' But this argument excludes the possibility of customers visiting a store to decide what they want, then going home to order it, knowing it may well be cheaper on the TV screen. Shops that come to function as non-profit making exhibition centres have a limited future.

Companies that have committed themselves to teleshopping also face uncertainty. Several software firms have developed 'intelligent agents', programmes that ask for details of a customer's requirements – a pale yellow cotton shirt, size 15, with button down collar, for instance – then interrogate all the appropriate on-line shops to find the lowest price. Retailers can tell their computers not to respond to these automated enquiries, but they will then lose sales. The alternative to a drastic erosion of margins, induced by a nation of consumers shopping on price, is perceived to be 'personalised marketing'. On-line stores might only deal with enquiries from 'intelligent agent' software if they are accompanied by information about the shopper's spending habits (compiled automatically by the set-top box). A big spender on menswear, for example, may be offered his yellow shirt for £10 but, noting that he has not bought a pair of trousers in three months, the software could go on to display corduroys in his size and construct a 'today only' price for the two. A week later, their computer might send a message about some matching brogues newly arrived in stock, reminding the consumer that winter is coming on and their last pair of sensible shoes was bought nine months ago. By enrolling in their loyalty scheme, the message might say that he would soon have enough digital reward points for a free sweater in the colours the system now knows he favours. Additionally, the points might be transferable to other on-line stores. He may even want to trade them with other users so they become, in effect, an alternative currency. The richer a consumer, the more likely it is that his television will keep making these overtures. None of them need breach controls around on-line privacy; it will be argued that the consumer 'voluntarily' gave the retailer's computer access to personal information when accepting their reduced rate shirt.

Such irritants of home shopping should not deter potential customers, provided the new 'two dimensional' stores can offer reliability and cost savings. This seems likely. The big brands moving into on-line trade will not want to compromise their public standing with unfulfilled promises and they will be aware that, if they do not pass on the eventual cost savings of shopping from home to consumers, new competitors will. With this way of shopping soon available – among other facilities – for only £200, it is reasonable to assume that a critical mass of 'early adopters' will be established. If we consider both the advances in the quality of teleshopping displays and the plummeting costs of accessing them, as they could be just ten years from now, it is not hard to see how traditional retailers could be forced into a downward spiral of narrowing ranges and rising prices.

Social effects of teleshopping

What is the likely wider impact of all this? Retailing currently accounts for 11 per cent of the UK workforce, 2.4 million people.[4] Whichever model of electronic trade's growth becomes reality, a significant proportion of those jobs are under threat. Lining up alongside former shop assistants and distribution staff at the Job Centre will be many of those formerly working for domestic manufacturers who lose out to globalisation induced by teleshopping's multinational bias.

Small companies will be disadvantaged because, lacking the brand name recognition and financial clout to get on to interactive television channels, they will have to take on the overheads of traditional store selling or rely on a far less dependable and less appealing Internet page. It is even possible that they will not be allowed to reach many potential customers at all. Already British Interactive Broadcasting have announced that they will only be supplying subscribers with 'the best of the Internet', in other words the services they decide users should have. BiB have also promised their teleshopping partners that Internet-based retailers will not be allowed on to the system.

On-line trade will diminish human contact in business transactions and the need to pay those who currently provide it. Anyone employed to give out information, schedule services, arrange logistics or take orders could find themselves on the wrong side of an unarguable financial equation. For instance, Federal Express, the parcel distribution company, calculates that it costs $8 in total overheads to process an order where one of their staff answers the phone to a customer but only ten cents where a customer has clicked through the company's on-line order form.[5]

Perhaps unexpectedly, customer relations can be boosted by a move on-line. Many of the big parcel companies, for instance, allow Net users to input a waybill number and then see their package's immediate whereabouts in the worldwide delivery chain. The information is automatically compiled by the central computer as barcodes on parcel labels are scanned each step of the way. This is much cheaper and more reassuring for an anxious customer than paying staff to take enquiries and then pursue errant packages through the organisation.

Thus, the trading revolution could bring about a substantial new wave of corporate downsizing in many companies. Those who keep their jobs are likely to find themselves subject to renewed demands for greater productivity. Because order taking by computer removes the human component and a large element of a company's distinctiveness from customer service, many organisations could find much of what they have to offer turned into a basic commodity, selling largely on price. For example, as the economics of on-line trade push parcel delivery companies further into interactive order taking, customer contact and the building of business relationships could decline in importance. Instead, instant price comparisons and ease of ordering among a spectrum of competing suppliers could create a market in which low cost offers are the key to success. In this envi-

ronment, aggressive management would thrive: the operator extracting the greatest output from its remaining workforce, who would have now lost any significant function as company ambassadors, leads the market.

Suburban malls, which so often provide the focus for an area, will increasingly find the convenience and cheapness of teleshopping impacting on their business prospects, just as their promises of all-under-one-roof convenience and better value have damaged many traditional high streets over the past decade. This could accentuate existing social divisions. Affluent consumers will be able to shop in comfort and safety from home, while those currently 'socially excluded' will not be attractive to on-line consumer services and could face further erosion of their ability to participate in work and in the networks of the wider community.

Selling on the Internet: what the Net prophets predict

Many commentators, however, see on-line trade as a force for good in society. They believe that widespread availability of trading technology through the Internet will create a more dynamic economy which opens up new opportunities for companies of all kinds. This faith rests on two pillars: a world in which anyone can set up an Internet page with order taking facilities; and the dawn of buyer–seller matching services on the Net.

Consider a motorist who needs work done on his car engine. Advocates of the Net-pages-for-all scenario for future electronic trade would point out how he could type the make of his vehicle, combined with his town and phrases like 'engine repair', into Internet search software. This would yield a list of local mechanics, albeit in no particular order. Some of them might quote prices on their pages, most should accept electronic mail. The consumer could send messages specifying the problem with the car. This should result in a flow of replies from which he can select a trader.

Buyer–seller matching services would do this initial weeding out for him. These are two-way markets, ones in which anyone can buy or sell. Matching services already exist on the Internet. The Sky Car Shop, for example, invites anyone with a secondhand car for sale to input its details, which will then be offered to potential buyers whose search parameters match the vehicle on make, price and location. Free to buyers, it costs sellers £1.99 a day to be listed, for which they are also displayed on Sky's teletext service. Comparable services already exist for condominiums in Miami,[6] computer equipment worldwide[7] and even aspiring British gigolos and their female clients.[8]

Both scenarios for our motorist rely on a level of Internet penetration that is probably five years away. By then, setting up a Net page with facilities like order taking and scheduling, both currently quite demanding, will have been made much easier by more user-friendly technology. But optimism that this will produce widespread economic revival is ill-founded: these trading conditions do not provide the basis for a true

market.

Limitations of Internet trade

A true electronic marketplace, as any currency dealer now knows, allows each seller to be paired instantly with the best buyer. All deals are assured and all participants have the overview they need to make informed trading decisions. By comparison, our motorist's search for a mechanic is hampered.

- The motorist cannot easily assess the solidity of his potential trading partner. In the currency markets, traders' qualifications to fulfil each specific deal are checked automatically by the central computer.
- The money dealers have one large marketplace in which virtually all buyers and sellers are available. But when an Internet buyer–seller matching service is successful it swiftly attracts competitor markets which dilute its efficiency. There are, for instance, at the last count, some 25 on-line job-finding services for Britain alone.[9] Only a few have distinctive niches. All have different ways of taking in information and boast differing strengths. For a would-be employer or job seeker deciding which market to use is almost arbitrary.
- Because Reuters enjoys a near monopoly, it can invest for the long term in a quality marketplace for currency traders. But an Internet market, besieged on all sides by competing services, needs to spend relentlessly on promotion and offer headline-grabbing innovations for fear of being eclipsed by noisier rivals.
- Bank dealers know that their marketplace is neutral. Users of Internet matching services could be less sure. Instead of finding the best seller for a buyer's needs, the software might be set to match him with the most profitable deal for its operator, based on the information given about his individual priorities and price band.
- Each deal over the Internet comes with hidden transaction costs, the most obvious being charges for transferring money. There could be other costs related to the fragmented nature of market operators: buyers might want automatically to forward details of each deal to an on-line solicitor to ensure fair play; security software may be needed to keep new breeds of computer viruses out of users' machines. Currency traders, in contrast, know that their deals are all contained within an integrated and secure computer network.
- Currency dealers come to market with privacy intact: their identities are only revealed to each other after both sides accept a trade. It is important that the market as a whole does not know, for example, that you are suddenly going short on Swiss francs. Someone shopping around Net sites has no such protection. Strict laws on Internet privacy might resolve this issue, but they appear to be less likely in the 'market-led' approach now being fostered by White House strategists, who, because

of the global nature of Internet trade, are effectively setting standards for the rest of the world.

- The different services available to our motorist will have varying standards of reliability, veracity, security of transaction, enforcement of deals and 'data cleaning' after something on offer has been sold. These vagaries will be concealed behind a potentially disconcerting variety of display formats. On the currency desks, conversely, everything is in one standardised layout, so dealers concentrate on comparing deals, not anxiously looking for loopholes in the better offers.

In time, the disparate elements in Internet trade may start to harmonise, thereby clearing out much of the 'clutter' between consumers and sellers. But this cannot be taken for granted. The protracted 'browser wars', between two competing makes of software that allow access to multimedia elements of the Net, have shown how a battle for dominance between just two companies can confuse users and hamper market development.

Already, there is a growing number of on-line job agencies: it is difficult to see how this potentially very useful sector will resolve its emerging differences and simplify access for the customer. (The companies involved will tend to resist any move towards one open marketplace for fear that this would commoditise their service and destroy their capacity to 'add value'. In other words they will tend to obstruct what electronic trade could achieve for their customers, in order to justify their existence.) Even if harmonisation of technicalities and then of information input were to be achieved, there would be other areas of uncertainty as on-line payment became more widespread. Problem areas are likely to include inconsistencies in the legality of on-line deals, redress against defaulters and means of ensuring the identity of a trader.

Faced with this environment for buyer–seller matching, small traders like garages are likely to band together over time to form national chains which can then support a high profile teleshopping site and its attendant technology for 'personalised marketing'. But each business in the alliance will then have to conform to the uniformity demanded by other, often more powerful, members and add a marketing fee on each transaction to support their membership. This could mean that the demise of small traders will accelerate, not diminish as so many hope, with the advent of electronic trade.

Choosing the future of on-line trade

On present trends, we are heading for a two-tier system of on-line trade. Teleshopping, the upper level in which only big business can sell, will be glossy, dependable and allow effortless ordering. Below that, the rest of us can offer our goods or services in a maelstrom of Internet pages and matching services in which the buyer must beware every step of the way. Where the currency markets have widened and now constantly

throw up new trading opportunities as a result of computerisation, the mass of consumer markets could become an inefficient on-line marketplace where big players progressively maximise their advantage.

Because this new marketplace will be less time consuming for the customer, cheaper to enter and slightly more efficient than the way we currently shop, it will be widely hailed as an advance. But this very limited step forward should not be seen as anything like the fulfilment of electronic trading's potential. The technology has far more to offer.

The rest of this book is about a secondary route for the trading revolution, one that sees on-line commerce as an opportunity for us all.

The alternative route

guaranteed electronic markets

What is a GEM?

The dawn of electronic trading has created a radical economic possibility: a new way of trading virtually everything. The system for delivering this is called 'guaranteed electronic markets' (GEMs).

The notion entails establishing a central computer service that runs many thousands of open electronic markets. These are neither order-taking systems nor crude buyer–seller matching services, but instantly reliable marketplaces in which anyone can buy and anyone can sell with confidence. These markets will bring pure electronic trade both to deals in which enormous sums change hands and to those in which low level transactions as diverse as hire of vacuum cleaners around a housing estate, consumer money lending and sale of surplus industrial polymers between small manufacturers.

Every problem that could blight Internet-style matching services will have been resolved for users of these markets. Neutrality of operation is assured and so is privacy. Each transaction is detailed in an authoritative, individualised contract: payment collection is then automatic. In addition, these markets are both informed and incentivised: they help users locate trading opportunities and offer inducements to trade responsibly.

Guaranteed electronic markets would be easily accessible. The technology would be non-proprietary, with markets available via the Internet or through interactive television to anyone who has proved their identity and established a means of payment. The system's own money deposit facilities are one possibility for this, allowing a link to users' bank accounts is another.

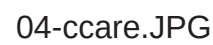
Although technically sophisticated, the key source of value added by GEMs for users is verification. Any counterparty offered to a buyer or seller by a GEM is safe because if they did not meet the automatically enforced requirements of that market sector they would not be displayed. Achieving this security across so many diverse markets will require the companies operating GEMs to go beyond simply writing code to liaise with organisations which would set the framework for each sector.

This chapter will demonstrate how GEMs could work.

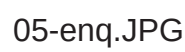
Sample transaction 1: booking a childminder

Consider a sample transaction for a GEMs user. On a Saturday afternoon in summer, mother of two Ms A Reader has work to do around the house and wants someone to look after her children for the afternoon, as family and friends are not available on this occasion. It might seem improbable to suggest she would entrust them to a stranger found through her interactive television but, as we shall see, her final choice would be more thoroughly vetted than many of the children's schoolteachers.

She starts by logging on to the GEMs central computer with her PIN number and is then presented with a screen showing a village of shops, each representing a different kind of trade. She clicks along to the Childcare centre and is immediately asked for more details:



Having selected Daycare, Ms Reader must now specify her requirements. She specifies an approximate time of 2.00pm to 6.00pm and clicks on the names of both her offspring (known to the central computer from past bookings). Immediately the system calculates the lowest price for that booking, in her area, for each of six grades of babysitter



Because this is a guaranteed market, anyone wanting to offer themselves as a childminder must have police clearance and be vetted by staff at a school in their area. Candidates are charged a set fee by the police or education authority for this assessment (just as they would pay for any other kind of licence application); if successful, their endorsement has to be input into the guaranteed markets system against a headteacher's or senior officer's personal identification number (PIN). Comparable mechanisms are crucial to the operation of each of the thousands of GEMs sectors.

Guaranteed markets are free markets

Traders rise through the grades automatically as their bookings mount and they can set their own pricing formula, deciding what they will charge according to day of the week, time of day, distance to be travelled, age of children and so on. The software constructs an individual price for each assignment based on these preferences. Carers can constantly tweak their formula, perhaps opting to lower their charges for families they have enjoyed working for in the past or trying to price themselves into certain kinds of work in pursuit of experience leading to a qualification.

Ms Reader is not well off and clicks for a grade one carer. Now she is offered a catalogue of available traders around her postcode area this afternoon; the cost of each of them has been individually calculated. Four verified grade one carers are available to work.

She is shown their GEMs details sheets, each one a combination of information compiled by the system and details input by the trader. The carers are displayed in price order, cheapest on top, with a graphical, hour by hour, breakdown of their charges for this afternoon.

o6-pixa.JPG

How the system motivates traders

All GEMs are incentivised. They encourage both dependable sellers and cooperative buyers while penalising the unreliable.

The system monitors each carer's record of bookings and upheld complaints from clients, then compiles them into a page of information that the carers cannot adjust. No one is compelled to make this page available to potential customers, but those who do not may appear to have something to hide. Tilly Mint's history on the system is freely available to clients, it takes one

Tilly's previous trading history shows how the availability of childcare has widened through the guaranteed market and the way high standards are enforced on participants. As a teenager she was endorsed by her school to enter the market for mother's helpers: hiring herself out at low cost to assist with mealtimes, bathtimes, putting to bed and play sessions while a parent undertook to remain in the house. As with all GEMs she had to pay a bond into the system allowing her to trade; in case of misbehaviour, a fine is deducted from that capital. A low level market like mother's helpers required only a nominal sum of £100. She did not find the money herself but approached an insurer who assessed her dependability and underwrote her operation in return for an automatically deducted percentage fee.

Any disputes between users are handled automatically. Tilly's previous trading record shows how. After clocking up 112 hours of bookings as a mother's helper she overslept one morning and failed to arrive for a commitment she had previously confirmed through the system. The waiting parent initiated the GEMs complaint procedure, her bond was frozen and she was not allowed to trade further until the dispute was resolved. When she next logged on, the software asked Tilly if she accepted that she failed to honour the booking. If she had not agreed, the system would have forwarded all details to her education authority with her bond being released to finance an adjudication which could penalise the untruthful party. (This process is explained in more

detail in the chapter 'Making it happen'.) So she owned up: a mandatory £50 of her bond was paid to the parent's account in compensation and, as a probationer, she forfeited her accumulated hours and had to begin again at zero.

This punishment was imposed automatically with no unwieldy judgement by GEMs staff or consideration of mitigating factors. Traders in guaranteed markets are able to specify exactly when they will be available to work, what they will charge, how much notice they require for a booking and all sorts of other parameters but, having set their terms of trade (which can be amended at any time), they must abide by them. The central computer will always try to re-assign a job if a trader has a crisis after accepting a booking (although any increase in costs must be borne by that individual's bond) but when a buyer makes a booking in this market they have to know that, if it is not fulfilled, they will receive substantial compensation.

The higher up the grades a trader moves the more they have to lose from any lapse in standards and the more reliable they will seek to be. But this entitles them to charge more for their services. This incentivisation works for buyers as well: Ms Reader knows that if she books Tilly and is a good employer for the afternoon, Tilly may well tell the system to offer the family a discount on her normal pricing formula from now on. Alternatively, if she has a bad time she might increase her cost for any future booking, or even tell the system not to list her as an option to the Reader family in future.

o8-cntr.JPG

After flicking through details sheets for the competition, Ms Reader returns to Tilly and clicks on the exact start and finish times she wants. Immediately, the system offers her a contract for the hire.

A contract for every transaction

This is the standard contract drawn up by GEMs lawyers for daycare of children, recognised by law in the country of operation. It is impartial and anticipates any likely dis-

putes between parent and minder. Tilly electronically 'signed' her half when she laid out her conditions of trade to the system. She could have changed any part of the on-line document but those amendments would be highlighted on the screen, making them immediately apparent to prospective clients. In practice, few buyers will bother to read contracts beyond a perfunctory scan for eye-catching amendments: if it is unaltered, they know it will be firm but fair on both sides. For sellers, the contract is at the heart of their relationship with GEMs, it outlines precisely what is expected of goods or services in any particular sector; if they are not happy with the standards it sets they either modify it or trade elsewhere.

Ms Reader accepts the contract and signs it by re-entering her PIN. The agreed sum is taken from her account and held by the system. Twenty four hours after completion of the booking it will be released to Tilly's account, minus GEMs' flat rate commission, unless her client initiates a dispute procedure. In that case it would be frozen until either Tilly admits her fault or an outside adjudicator authorises resolution.

Only after contract signing is Tilly's address and phone number revealed. Making it available earlier might have tempted any purchaser to bypass the GEM and book her by phone; Ms Reader might try to do this in the future but those bookings would have no contractual underpinning. Besides, the system has revenue protection built in. If traders repeatedly list themselves as available and then remove themselves without getting a booking the software will warn them and, eventually, de-list them. Again, this is mechanical with no right of appeal; GEMs do not carry the overheads to accommodate user pleadings, nor do they wish to depart from the automatically applied fairness that enables all users to know exactly where they stand.

Solid transactions in seconds

In this way, the best value childminder in the area is booked for the afternoon. Ms Reader can rest assured that the woman is subject to comprehensive and continuous vetting. A thoroughly worded contract exists between the two parties and payment has been put on hold to ensure compliance. Unavoidable financial penalties await the trader if she does not show up. And, because the small print of GEMs contracts can be taken as read, the whole process took only 30 seconds.

Across town, Tilly's terminal now displays full details of the booking. She knows she is safe, going to a stranger's house, as full details of the assignment have been transferred to her GEMs archive file. To ensure her reliability Tilly has opted for a service whereby the central computer phones her home and plays a recorded message telling her to log on immediately, whenever she gets a booking. (She had specifically told the system that she would be at home this lunchtime in anticipation of an assignment.) If she fails to check in and confirm the message by 1.30pm the job will be automatically re-assigned, perhaps to a higher grade trader, with her bond meeting the difference in

price.

Tilly's decision to be available for short notice bookings, for example, might have come from studying this *Market overview* earlier in the week.

09-OVE~1.JPG

GEMs are informed markets

The software compiles information about market activity in each sector. It is available to any user who can then use it to plot trading strategy.

Tilly can 'data mine' this constantly updated information by clicking through different parameters, looking at demand in possible work areas away from home, perhaps. However, if she focuses too tightly on a corner of the market, GEMs will refuse to display details. The system's commitment to user privacy forbids it from revealing activity drawing on fewer than twenty traders because, otherwise, an enquirer may be able to deduce income and work patterns of a competitor.

This *Market overview* screen allows Tilly constantly to respond to an evolving marketplace. Her decision to be available for short notice work on Saturday, for instance, comes from seeing significant unmet demand over the last few weeks from parents making last minute bookings at weekend lunchtimes. Likewise, she can plot career advancement. The *Demand for specialists* section might demonstrate that many parents in her area are clicking on the *Special requirements* button within childcare and trying to hire a qualified art teacher babysitter, who will come round on a rainy day with rolls of paper and pots of paint, or a registered swimming instructor babysitter who could be equally appreciated on a sunny afternoon. If traders within those parameters can command a significant premium she could look towards financing further training knowing she is likely to earn a return on the investment. Thus GEMs would constantly find equilibrium between supply and demand as they expand.

She goes back to her terminal, selects the GEMs *Garden centre* and clicks on *Mowers*. Immediately she sees the options available.

10-mowa.JGP

The above example indicates one GEMs sector in action. There would, ultimately, be countless others. Just as the verified babysitter was hired instantly, and safely, from an informed highly competitive marketplace, so could secretaries, car repairers, factory managers and a whole range of traders be engaged in seconds with minimal overheads.

GEMs transactions are risk free

The booking process required very little thought in terms of the mechanics. Could users be just as sanguine about wider aspects of the market? Public faith in the neutrality, security and reliability of GEMs trading is critical to the operation. The aim is to enable point-and-click purchasing that is technically effortless and activates no back-of-the-mind caution whatsoever. To this end, GEMs must operate according to the principles of guaranteed electronic markets (see appendix) which mandate a relationship with users based on transparency, extensive safety precautions and pitiless inspection of the core computer. GEMs are steered, in Adam Smith's phrase, by 'the guiding hand of individual self-interest' among users, and nothing else.

11-mapa.JPG

The next screen asks when she requires a mower, confirms it is needed at her home address and offers a list of machine types – petrol, manual, electric, ride on – which she can prioritise. After she inputs her preferences the central computer uses its post-code software to display a map, with her home at the centre, showing machines available for hire locally that afternoon.

Unlike other on-line services, a GEMs terminal would not be compiling information about its users' buying habits. Instead it would offer a 'user questionnaire', to be filled in if they wish, in which preferences that could help the system automatically narrow down trading options are outlined. The mother in the above case for instance might have clicked on the childcare option in her user questionnaire that specified 'will only hire female babysitters'.

Clicking on any of the options produces the details sheet for that individual mower. It is largely compiled from manufacturer's information and photos held in system archives but includes an assessment of that specific machine's condition input by the owner. This will form part of any eventual contract for hire.

12-pix.JPG

Sample transaction 2: renting a lawnmower

Guaranteed electronic markets for goods would be every bit as rigorous as those for services. For example, after sorting out her childrens' welfare for the afternoon our fictitious mother decides she needs to cut the grass but lacks a lawnmower.

She could opt to purchase a grass cutter, in which case the system would make a note of her requirements and search through what it had on offer from companies or individuals at the moment. Companies are able to interface their stock control computers with GEMs so up-to-date inventory is always available for sale. But GEMs users will have little need to own expensive machinery which is rarely used because the system runs a vibrant hire market in which to rent items as the need arises. She clicks on *Hire*.

Thus Ms Reader is rewarded for her track record of responsibility, while the mower hire market keeps expanding as owners realise how safe these transactions can be. After the contract is signed with a PIN the owner's address and phone number appear. Then the system asks if she wants an additional

13-cllct.JPG

Big and small sell equally

GEMs are completely neutral markets, programmed only to meet each user's needs rather than to sell from any particular source. They group together all options for a buyer's enquiry, regardless of who provides them. In the case of mowers, the map showing availability this afternoon includes blade choppers available for hire from both individuals and plant hire shops. The cheapest deals are likely to be from ordinary gardeners who have said they will be at home this afternoon for collection of their mower (or, alternatively, have used the system to contract a neighbour who will let out the owner's possessions in return for a slice of the fee, automatically diverted to their account). If there was a real shortage of turf trimmers locally Ms Reader could call up the market overview. If it showed hirers paying high prices she might consider purchasing her own machine and immediately recouping the investment by renting it out.

14-conf.JPG

As part of the contractual chain, the deliverer is given an eight-letter code word decided by the user or holder. As always, everyone in the chain is kept informed.

The rewards of responsible trading

A click on this screen generates a contract for hire of the mower, again pre-signed by the owner. It stipulates that a deposit of £60 be deducted from Ms Reader's account and frozen until the machine is returned safely. Even so, might non-business orientated gardeners be reluctant to let out their tools? For peace of mind, any GEMs seller can stipulate with whom they will do business. The owner of this mower, a cautious man, has specified that his grass cutter is not to be hired to anyone without a record of at least 50 complaint-free hirings of domestic goods from a GEM. The system checks that our sample user clears this hurdle before listing his machine as an option. However, he has had to drop his price to remain competitive for such desirable hirers.

New opportunities

Guaranteed markets could bring about economic opportunities that would not otherwise exist. In this case, all sorts of people could make a living out of collecting and delivering goods traded over the system around their area. They set up a pricing structure based on journey times (computed by the system from its knowledge of postcodes), time of day, kind of service in which they hope to specialise and preferred customers, then leave their terminal switched on during periods when they have said they will be on duty. The central computer sends a pulse to make it signal whenever a job is found. Full-time deliverers might opt for a dashboard-mounted terminal similar to those employed by motoring organisation patrols at present.

Will the owner, or neighbour holding the mower, hand it over to anyone turning up on the doorstep claiming to be a contracted deliverer?

When the mower arrives Ms Reader will check it matches the description and take a few seconds to sign for it on her screen; the owner will do the same on its return. Should either fail to do this the transaction is considered to be in dispute and, if neither party admits liability when questioned by the system, it will be referred to the small claims court with the deposit used to cover costs until judgement.

Again, it is worth noting the timescale. The best value option, from the widest possible marketplace, has been quickly confirmed for highly competitively priced delivery. And again, this is just one small example: for mower read motorbike, packaging machine, speedboat, football strip for an entire team, combine harvester and so on. All could be safely hired out to verified responsible users with pick-up and return at the owner's convenience.

Each GEM is unique

Each GEM would be structured around the specific priorities of buyers in that particular sector. When hiring a plumber, for instance, a crucial factor is often how long it would

take each available trader to reach the customer. So that GEM will calculate approximate arrival times based on its knowledge of each tradesman's current assignment. If purchasing a greetings card, the immediate considerations are cover image, inside message and size. That GEM will allow sellers to scan their design in, input dimensions (to be displayed relative to an adult hand icon for instant reference by purchasers) and categorise their product as it would be filed in a card shop. A company seeking consultants for ongoing work on their internal audit practices probably wants to work with familiar faces, so that GEM would offer photographs of experts they had hired in the past and help construct timetables based on each one's availability.

At the heart of every deal in every sector are the processes of verification, price construction, matching each buyer with the best seller for their needs, constructing a binding contract, holding payment and incentivisation for good traders. No seller would be immune from this discipline, not even the biggest multinational company. Within those guarantees of solid trade, sellers come to market on their own terms. It does not matter if you have one lovingly crafted greeting card to be posted to any eventual purchaser or hundreds an hour falling off the presses that you will only ship to wholesalers by the vanload. GEMs will ask for details of when and how each seller is willing to despatch, ensuring that their output is only offered to relevant buyers.

The system's ability to construct chains of transactions

Both transactions carried out by the sample mother are straightforward. The proposed system would be capable of setting up much more advanced transactional chains, particularly in business-to-business markets. Consider the case of a transport manager at a furniture manufacturers who, at 6.00pm on a Friday, suddenly learns that a shipper 500 miles away wants twenty units of his company's new double bed for sailing time tomorrow morning. Going to the guaranteed *Commercial transport* market, he answers questions about the weight and size of his load, its destination postcode, starting point postcode, availability for collection and required delivery time. Instantly, the system sifts through pricing options from any supplier who already has capacity on trucks going between the two cities (the empty and half empty lorries traversing the country could be a key target for the efficiencies induced by GEMs). However, let us assume that the GEM cannot construct a deal to get all the beds to the delivery point within the very narrow time window for dropping off. It looks at haulage companies which have a truck and driver on standby for the night but the lateness of the assignment makes that prohibitively expensive.

The cheapest deal the software can construct comes from combining sellers in its *Dry hire trucks and HGV drivers – available immediately* markets. First it books a pantechnicon that the owners had specified would be available for pick-up that evening using its postcode mapping software to ensure proximity to the bed factory. Then it proffers a

selection of self-employed drivers, all of whom have been verified by their insurers and are available for work that night. Once one is selected by the transport manager, he is issued with a code to permit collection of the truck, plus journey times drawn up by the system for his collection through to drop off. Additionally, the system combs its records for a mirror booking coming the other way, enabling the two drivers – with charterers' permission – to swap trucks midway and be at home for breakfast, again using unique codes to confirm each other's identity at a specified motorway services station. Furthermore, the truck's currently empty return journey the next day can go instantly up for sale in the *Available loadspace* GEM. Any profit made after GEM commission would then accrue to the bedmaker's account.

This seemingly complex chain of suppliers and commitments was constructed and fully contracted in a minute. As a regular user, our transport manager does not bother to read the contracts before signing. They had not been amended and he was able to trust the system to know they would be fair and would provide penalties from the experienced drivers in case of unreliability and compensation from the truck owner in case of non-availability. Likewise, he knew the vehicle would be roadworthy and insured for any driver, otherwise it could not have been offered. Guaranteed markets would put this kind of 'lean operation' – from the widest possible marketplace – in the reach of every company.

Consumers, too, could use the system's ability to build a contractual chain for many transactions. It is worth recalling that when the telephone was first launched, voices of authority derided it as a device for gossip and scorned its potential for serious business conversations. Now, of course, it is the first point of contact for even the most solemn transactions because of its reliability and convenience. If a GEMs system could provide effortless on-line market efficiency across even the most sensitive trade sectors, it could lead to a mass market point-and-clicking its way to trades in almost every marketplace.

A comparison: GEMs and other forms of on-line trade

Some believe that electronic trade, if left to market forces, will inevitably evolve into a universal, fluid, informed and hyper-efficient marketplace like the ones outlined in this chapter. This is mistaken. To underline the point, consider the likely course of our sample mother's two transactions if she had not had some kind of fully featured, officially backed, electronic markets system to rise above the on-line fray.

There may in time be multiple buyer–seller matching services for babysitters available to those with Net access but, without trustworthy trading records and substantial contractual underpinning, they promise little not already on offer among the advertising cards displayed in corner-shop windows. Well-heeled parents in cities and towns will probably be able to hire an authenticated nanny from Poppin's People, or one of the other agencies on-line, but, without critical mass in any of the services, they would be

unlikely to find someone available locally at short notice. Likewise in the case of the mower: various plant hire shops will undoubtedly set up on-line order-taking facilities and some of them may allow intelligent agent software to compare prices. But they might not be the firms with a branch near her home. In the future, there could be garden tool hire services on the Net in which anyone could offer their goods but, without trusted trading records and incentivisation, it would be unlikely to tempt owners who valued their machines into the marketplace.

GEMs would enable users to shop in a pure market. True, the need for regulation necessitates unfamiliar mechanisms – the issue of PINs with vehicle insurance, for instance, or education authorities ruling on an individual's suitability for work with children (as they already do with teachers). But, once GEMs acquired momentum, these changes would be driven from the bottom up. The first insurer to print GEMs-compatible PINs on policies, for instance, would have a clear competitive advantage for those even vaguely considering letting out their vehicles. Hopeful applicants, who will pay for an endorsement to enter a guaranteed childcare market, could galvanise the establishment of local authority assessment panels.

negotiations with coach station owners.

According to current projections for electronic trade, companies like Stagecoach have an assured future. Setting up a teleshopping site will allow them to shed telesales and enquiry bureau staff while plotting precise marketing strategies to maximise profit from potential travellers whose preferences and pricing sensitivities will all be stored. Because of the company's size, that database will rapidly provide a wealth of information about patterns in demand. This marketing muscle will enable further dominance of coach routes, so they can schedule drivers yet more cost effectively and accrue even greater purchasing power.

A very different kind of coach operator would prosper within a GEMs framework. Three qualified PSV drivers might, between them, lease a 52-seater that they operate out of, say, Stockport, trading exclusively in the *Travel – departing Manchester area – medium distance* GEM. One drives overnight routes, returning for early morning when the second takes their vehicle out again to be back by lunchtime for the third man's eight hours at the wheel. Each decides which destination they are going to serve (changing it from day to day if they wish), buying bus station slots in the appropriate GEM and putting their seats up for sale, with a pricing formula of their choice, as soon as they decide on each day's route.

Every time a seat is sold an eight-letter code is issued. This becomes the passenger's ticket, to be presented as they board. This market would be more regulated than anything currently provided by Stagecoach and its heavyweight competitors. From the moment a first passenger puts their money into escrow there is a contract with the appropriate driver to make that journey at the times specified with the standards of comfort offered. Additionally, the standard wording provides for grouping of passengers

Nor does strategic planning suffer from lack of size in their three man operation: every week they decide which routes to offer for the following few days using the appropriate GEMs market overview.

15-BUS~1.JPG

Instead, our three-men-and-a-coach outfit should look towards market differentiation, taking stewardesses into the partnership to offer on-board hospitality in return for a price increase, for instance, or pioneering new routes.

Any organisation whose strengths are in centralised marketing and order taking, exploiting a brand name to reassure potential customers would be under threat from GEMs. Breakdown organisations like the AA and RAC could lose out to qualified car maintenance experts around the country. Double glazing firms would suffer from individual installers able to purchase their own materials for just-in-time delivery in a GEM. A company posting parcels from city A to city B at any given time could bypass TNT, DHL, or Parcel Force for a sole trader with a van. (This market would be subject to especially heavy bonding and verification procedures because security is so crucial.) High street bookmakers could be undercut by lone punters offering odds on a race: before accepting the bet, the system would ensure each one had a sum in bond to pay out on any stake proffered.

The demise of retailers

Existing electronic markets will group purchasers together if this will deliver a better deal. GEMs would do the same, forming neighbourhood 'buyers' clubs', for instance, among households who wished to participate: good news for cost-conscious shoppers, bad news for retailers.

Big supermarket chains already plan an on-line future where customers input their shopping lists, possibly by clicking around a graphic array of goods in an on-screen 'virtual' store. The total cost is then charged to a credit card and the goods despatched. GEMs would have a supermarket display that also takes in shopping lists but then treats them as a list of component parts, each to be procured and delivered as cheaply as possible. One way of doing that is to ask users if they wish to combine with neighbours to form a buyers' club. This would merge each household's orders into a bulk shopping list, then engage a deliverer to travel to local cash and carry stores, collecting goods which have already been bought by the system with the pooled cash: 500 cans of baked beans here, a crate of cornflakes there, and so on. The deliverer then breaks up his load, according to a list printed out by his GEMs terminal, and drops them off accordingly.

If this facility picked up momentum, the next development could be cash and carry's being bypassed. Heinz, for instance, might decide to sell their beans direct and let GEMs schedule each rendezvous, where a month's supply of cans for one street are handed to a waiting deliverer. Good news for Heinz? Not necessarily: any competing food processor can monitor demand for beans on the system then decide to meet it and those peripatetic manufacturers can be canning beans this month if there is demand but processing another product four weeks later if there is not. (Any user can

hire market for their products. For example, caravans no longer need sit idly in driveways for 48 weeks a year while their owners earn the money required to spend a couple of fortnights a year on the road; they can be rented out to GEMs users. We have no way of knowing if that reduction in the cost of ownership will lead to more demand for new mobile homes or whether potential purchasers would consult the GEMs Market overview and opt for hiring instead. In either case, what caravans there are should be in more frequent use and require more maintenance. However, as with some service providers, the manufacturers might find some workers, in this case repair engineers, leaving to hire themselves out through an expanding GEM for their services.

How should businesses respond?

What advice might be given to strategists in large companies contemplating the growth of a large market of GEMs users? They could try holding out against the system and its empowered buyers, but it would take only one competitor to start trading in the appropriate GEM and their customer base might begin to fade away. Instead, they should look for potentially high margin areas of activity that this new marketplace will be ill-equipped to serve. Car hire companies, to take an obvious example, would move into an uncertain future facing competition from countless ordinary motorists now able to hire out their vehicle, specifying what sort of customer they were willing to do business with. Hertz, Avis or Budget might see an opening in providing for the high risk occasional GEMs hirer who has no trading record with which to access the better deals available in their neighbourhood. Alternatively, the established companies could anticipate car hire becoming far more widespread than it is today and concentrate on niche opportunities where ordinary motorists cannot readily compete: at airports or railway stations, for instance.

Rather than viewing their routes as prime assets, companies such as Stagecoach could begin to see their vehicles, which would be in demand for leasing by self-employed drivers, as a business core. Supermarkets might eventually reinvent themselves around consumers' day-to-day needs, providing local depots for readily available fresh produce which can then be collected by GEMs deliverers. This would be an unsettling profound economic change; were it to happen, the winning companies would be those which contributed most to value and flexibility in each market sector.

What of brand value, often a manufacturer's biggest asset, in this proposed new order? The picture is not as bleak as it may seem. Certainly a product's emotional appeal is likely to be less important when buyers can look up an objective trading record behind any option presented to them (or speculate on why it is not being made available). But the easy availability of cheaper options need not threaten the value behind a brand name. Anyone visiting an ASDA supermarket, for instance, in search of a basic litre carton of pure orange juice will find Del Monte at 77p, ASDA's own label for

A typical week's diary for one working mother might look like this:

16-diary.JGP

New patterns of work

GEMs could help to hasten the end of nine-to-five employment in the private sector and potentially turn every user into a businessperson in their own right. GEMs would thus be a force for the promotion of a flexible labour market and would be compatible with the vision advanced by Charles Handy and other writers on the future of work, of a world of 'portfolio' workers, creating a livelihood from a mixture of part-time, temporary and informal work. As Handy has acknowledged, this vision is not one that will be feasible or comfortable for everyone.[10] However, it goes with the grain of many current developments in the labour market and in organisational design. The work landscape encouraged by GEMs could bring increased satisfaction, opportunities and security for many users. In this new order, portfolio working – individuals with a customised range of employers and jobs – might spread to become the norm. Every GEMs user would be offered a diary around which the system can look for commitments according to the individual's instructions. It would allow them to interact, efficiently, with as many employers as they wish.

In this environment, employers interview and accept more staff than they need, telling GEMs who is on their approved list for various jobs. They then input their workforce requirements day to day and GEMs offers the work periods to members of the pool who must then sign a contract of acceptance for each shift. Both sides gain flexibility from this approach. Businesses can let staffing ebb and flow at short notice: workers are able to reach across sectors to pursue multiple careers, all of them scheduled according to personal priorities. Once again, it is an incentivised market: if our sample worker does a good job waitressing she may be promoted by her manager to a higher grade. That does not necessarily mean more money but the system will start to offer her first

returns time as a tamper-proof statement of their earnings on the system. As form filling gives way to automatic calculation on a transaction by transaction basis, the tax system can become much more finely tuned, automatically lowering the rate for babysitting assignments where the child is registered disabled for instance.

Assuming GEMs follow the pattern of all other large scale electronic trading systems and dramatically push up the number of transactions compared to 'old' ways of doing business, the tax burden could be much more thinly spread. GEMs-induced efficiencies in purchasing and hiring for hospitals, schools, prisons, police and the armed forces supplies could further increase value to taxpayers. It would be unacceptable to impose a standard GEMs tax on transactions over the system: tax should be levied at the same rate as in any other forum in which buyers meet sellers; it could even be fractionally lower, because of the reduced overheads for collection, if users choose to make their automatically compiled accounts available to inspectors.

Benefits payments could become equally responsive although GEMs would not cooperate in any surveillance of users' trading activities. But an applicant who convinced DHS officials of their low income, using GEMs records if that is their wish, could have income below a certain level topped up from public funds directly to their GEM terminal. If desired, those payments could be restricted to use in certain markets, such as children's clothing or food.

A GEMs economy will require far-reaching decisions about minimum wage legislation, working hours, retirement ages and other employment issues. Ideological judgement is also required on whether to use taxation to dampen the febrile short-termism of truly efficient electronic markets: by levying a higher rate on the opportunistic, short-lived manufacturer than on an established processor, for instance, or by penalising latecomers who bring over-supply into travel markets. All these are political judgements, to be made through democratic process, then enforced neutrally by GEMs systems.

International advantage

On-line trade is expected to help the development of truly global marketplaces. Yet GEMs would be rooted in their own country because the crucial underpinning to each deal is that nation's legal and regulatory structures. Paradoxically, this could give the operating country enormous international advantages. So many mantras of multinational management could become a reality with GEMs: fast time to market, just-in-time delivery, no debt chains, data mining, low transaction costs. Uniquely, however, in a GEMs regime these would be as available to a pensioner selling her knitted scarves as to a global manufacturer.

GEMs would create a series of interlinked perfect markets. Previously confined to the pages of economics text books, this trading environment would allow both buyers and sellers to make fully informed decisions, so each market finds equilibrium at a point

be cheapest for the buyer. A fully fledged GEMs economy would motivate users to interact around their locality as they hire goods, work for neighbours and combine with others nearby for enhanced buying power.

A secondary currency

This community-oriented financial system could be enhanced if GEMs were to carry their own, government backed, parallel economy. Each personal GEMs account could come with a one-off allocation of 500 electronic 'parallel official economy tokens' (POETs) released in monthly tranches. Any non-business user could offer goods or services in exchange for POETs.

Around the world in the past decade, smaller scale, paper-based, local exchange and trading schemes (LETs) have helped individuals previously marginalised by the mainstream economy, to offer themselves as hairdressers, counsellors, cleaners, cooks, childminders, builders, gardeners and so on.[13] A GEMs system would allow users to do all this with its standard benefits of verification, diary scheduling, personalised pricing structures and contractual and payment back-up. Because POETs would have no value outside the GEMs system, they are likely to be kept in rapid circulation with ever widening acceptability. Users will always prefer 'hard' currency, of course, but may be induced to offer their goods or services for a POET rate as well so they begin to accumulate a trading record – with all the benefits that would entail – rather than continuing to live on the economic sidelines.

This empowering 'people's currency' would not be an act of charity by GEM operators. The system would still take its cut of each POET transaction and sell those points to users for 'real money' in a *Currency exchange* GEM. If the POETs economy were to liberate as much activity as paper-based schemes have, their value could harden substantially. For GEMs backers, this is one of the miracles of electronic markets: money can be created out of nothing, to lubricate market sectors hitherto excluded from the mainstream economy, with a profit to be made on the activities that are thus enabled.

POETs could do much for the take-up rate of GEMs. In effect, each new user is welcomed with free money which they may as well spend on the system because it has no external value. Middle class users are unlikely to go out and earn fresh funds in the parallel economy but, if the floating exchange rate is favourable, they might scent a bargain in buying top-up points with which to hire household assistance. A busy mother, for instance, could contract out her gardening to an instantly available reliable local teenager who then uses the points to buy second-hand CDs.

The usefulness of POETs would have to be controlled: if they were to be given trading parity with sterling they would just massively devalue the main currency and benefit no one. One option is to confine the postcode areas in which they could be spent to, say, within 1,000 households of the user's registered home. Certainly POETs

done, the cost of establishing each additional GEMs market is low. Developing into a logical first port of call for everyone's enquiry is the route to constantly increasing turnover.

In pursuit of that universal appeal the GEMs central computer system might include services that involve no money exchange, and therefore no commission, but for which it charges a flat fee. These features would further exploit the system's ability to verify individuals, take in details of their requirements and match them through an unintimidating contract that ensures fair play. Programs for pulling together amateur sports teams, French-speaking circles and reggae bands might be offered. None of these activities would add a great deal to GEMs' immediate bottom line but they would provide social opportunities to people with time on their hands, who might then start trading in more profitable sectors.

Other GEMs flat rate services, of particular benefit to the less well-off, include legal functions. A couple looking to register their intention to live together could, for instance, each sign half a partnership agreement to be annotated with date and time by the system and locked into a tamper-proof page in case of disputes later. Business partnership agreements, like the one that would bind the trio of coach drivers mentioned earlier, would be equally accessible and flexible. Affidavits could be sworn likewise after an encounter with an unsatisfactory trader.

engender and encourage GEMs technology to fulfil its democratic potential.

How GEMs could reduce crime

Even those who believe criminal behaviour bears no relation to social deprivation might concede that the spread of opportunity that would result from a widely used GEMs system would be likely to help reduce crime. Not only would everyone who wished to have the opportunity to start building up a responsible behaviour record with expanded sectors of economic activity in which to try reaping its rewards, but the 'grey' informal economy would lose much of its attraction. One 1997 survey puts the figure for this illicit trading at up to a quarter of European countries' economic activity,[14] not least because it is so cheap and flexible a way to enter the market. For example: at present, someone selling Christmas trees from the back of a van might have grown them himself and be offering them in this way to avoid the high margin a shop would take for selling them. Alternatively, it is possible that he has stolen them from a grower. In a full developed GEMs world, selling them himself for less cost and less effort than driving to a lay-by and waiting for buyers is an obvious option. If he has not chosen it, it could be because they were obtained illegally and he fears a contract proving their sale. Crime detection can thus become much more focused.

Other currently 'grey' areas would be brought to a head by GEMs: prostitution, for instance. If an area of trade is legal in the country of operation, it eventually has to be covered by a GEM. The sex industry is, broadly, legal; therefore, it must, ultimately, have a GEM. Such a service would have much to commend it. Workers would gain protection, swapping their pitch under a lamppost for a seat at home keying in their list of services, pricing formula and hours available. If the seller is willing, their clients too can be protected by having their names concealed on contracts, to be revealed only after arbitration if there is any misbehaviour.

While a *Personal services – local – prostitution* GEM would do much to clean up phone boxes and street corners in areas where the trade is currently plied, there would be many who object to such transactions becoming so effortless. GEMs would not enforce a libertarian or any other social agenda on individuals. It would take only one click in the User questionnaire to remove all the *Personal services* markets permanently from any machine on which an individual logs in. Obviously, those sectors would need to be automatically censored from any under-age user.

GEMs enable activist consumers

GEMs users would be able to customise their relationship with the system in many ways. Vegetarians could ensure meat-related products were not displayed, orthodox Jews might want to click for the facility that ensures they are offered only Kosher produce. This customisation could be extended to promote the emerging Green and

neurial activity by millions of ordinary traders. True, technical brilliance would be compromised by the needs of a uniform system launched before technological development had reached a plateau. Railways suffered a similar fate in that the network grew around George Stephenson's 'cart track' gauge when a seven foot width between rails, it later emerged, would have been technically superior. But the advantages of directing what we already know about electronic markets into a mass system are overwhelming for anyone who believes in an 'inclusive' capitalism.

GEMs would provide motivation and career prospects that a large number of low paid workers and those excluded from work may feel they have lost sight of for ever. The system would make an economic virtue of daily contact between people who have become insular in a world where their potential – social and economic – so often remains repressed by the requirements of multinational market capitalism. GEMS would elevate the disadvantaged not by redistribution of wealth through taxation but by constantly redistributing opportunity.

Making it happen

The size of the task

Large claims have been made in this book for what GEMs could achieve but there is nothing unrealistic about the proposed project. This chapter shows how the service could start on a small scale but then, having fully tested the core programming, how it would develop quickly. For this, backers capable of large scale long-term investment will be essential, as will official endorsement in the country of operation. There will also be influential opposition to overcome.

The vision of guaranteed electronic markets as a public utility relies on economies of scale. At the heart of the system would be a core computer running software functions which are accessed as required by varying market sectors. Some of these functions already exist: programming that computes journey lengths and times for instance, has been in use by distribution managers since the mid-1990s. Other functions remain to be developed. All too often, past infrastructure projects have had to plunge into development without knowing how key links in the chain would be resolved. Work was begun on the Chester to Holyhead railway, for example, in 1845, with a five mile gap in the plans because no one knew how to bridge the Menai Straits. This confidence provided impetus for the invention of wrought iron girders.[15]

The eventual programming required for the proposed system would be formidable. On top of everything outlined so far, many sectors will need their own software to facilitate the precise trading opportunities that will keep markets growing. Taxi drivers, for instance, who sell a one way journey on the system should be offered the means to underprice all competitors for a return journey, because they will have to make that trip anyway. If permitted, GEMs would give a facility to airlines with empty seats on tomorrow's departures which want to auction them among users. In the soft furnishings market, for example, pattern display programming would be needed to enable someone with a sofa to sell to look at a grid of all pattern types, then click through more tightly defined displays and colour palettes until their particular print was showing on screen, ready to be demonstrated to potential buyers.

The system would also need screen displays comparable to those offered by

teleshopping computers. A further cost will be the establishment of product archives. In the sofa example above a user would, in reality, rarely need to laboriously narrow down the pattern: instead they would simply type in the product code and the GEMs data-bank would display the design. It would also illustrate the dimensions and list the years in which that model was manufactured.

GEMs would have some significant limitations. Some markets are too restricted in the range of buyers and sellers for the system to make any impact: specialised submarine components – which have only one domestic buyer – are an extreme example of a highly restricted sector. Other sectors lack even the rudimentary standardisation that any electronic trading requires: antique furniture is one, hire of actors another. The GEMs system could, eventually, attempt to develop markets like these, but not expect anything more than light usage.

In the short term, any company launching GEMs would be piloting the software, contractual legalities and consumer reassurance strategy. Medium-term plans could involve rolling out more market sectors while beginning to lobby governments about the advantages of a fully fledged service, embedded in law. If GEMs succeeds in one developed country, the long-term potential is global, and pioneering companies would have a huge lead in the development of key software.

Starting small

There is already opportunity for a small scale launch of GEMs, probably on the Internet, initially in just one market sector. The chosen sector is likely to be business-to-business trading, because more companies than homes have a Internet connection. It should focus on the kind of trading conditions in which a GEM could have dramatic impact: a diverse range of buyers and sellers whose requirements change frequently, often at short notice. Options include:

- *Loadspace.* Empty commercial vehicles returning from a delivery could be promising territory for the efficiencies of a GEM. Any transport manager would be able to enter the start and end points for a trip on which one of his vehicles had room to spare. He would need a point-and-click interface to specify what cubic capacity was available, its shape, maximum weight of load and the types of cargo his truck could carry. Then he would set a pricing formula, with parameters based on weight plus mileage deviation from the set route required to collect and drop off. Anyone with freight to ship could input its point of origin, destination, characteristics and time window for a match.
- *Computer equipment.* A GEM for desktop computers would take details from an individual selling their 1987 Apple Mac as readily as it would allow Viglen, Compaq or Dell to offer their entire annual output. All those machines would be available as

options to a buyer, who would know that they were protected by escrow payments, impartial contracts and automatically enforced fines. If, for instance, a contract agrees 'despatch today' and it does not happen, the vendor – whether disorganised individual or hyperbolic multinational – will forfeit a portion of the price back to the purchaser.

- *Short-term professional help.* Just as Ms Reader hired a babysitter via a GEM, so could a firm engage a temporary secretary for five days, a computer programmer for a week or an accountant for their audit preparation period. Unlike the imprecise service offered by existing Internet job matching schemes, a GEM would list verified traders known to be available for the assignment, with their trading records available for inspection and ready to be contracted, with penalties for non-compliance, in a few keystrokes.

Once the basic mechanisms of a GEM were working, its backers should look for immediate growth to critical mass in many additional market sectors. Without this decisive push, the system risks being sidelined by a technically inferior, but more stridently marketed, rival. Because there is so little consumer awareness of the long-term potential of electronic trade, GEMs will always be vulnerable to other start-ups claiming to bring true electronic markets within everyone's reach but lacking the underlying protection procedures.

How big could it become? How much could it charge?

How big could the GEMs system become? For a country the size of Britain, I estimate an ultimate average of ten transactions a day per adult, say around 500 million deals every 24 hours. Technically that is not implausible: the existing peak of 5,000 trades in a second on SABRE (the travel reservations system discussed earlier) multiplied by seconds in a day gives a (purely theoretical) capacity of 432 million per day. Is it an overly optimistic figure for patterns of usage? Hiring painting equipment for the day locally, then engaging a teenager to immediately cycle round with it while another deliverer returns it later would amount to three deals and – because they were all within a verified, fully competitive, market with Lilliputian transaction costs – far cheaper for someone who only decorates occasionally than purchasing, say, brushes, rollers and a ladder of their own. GEMs could create an explosion of deals that have no precedent at the time of writing.

How are GEMs commissions to be priced? Clearly the set-up costs are very high. But a localised market such as that noted above requires nothing more than a handful of photographs illustrating types of painting equipment to set up because the core programming, for verified local hires, would already be propelling hundreds of markets in household goods, garden implements, toys, beauty products, recreation accessories, vehicles

of all types and office or factory equipment. Some of those trades – fork lift trucks, vacation accommodation, industrial mixers – will be comparatively high value, others less so. But the system should charge a flat rate commission for the sake of simplicity. The process of buying or selling on a GEM must always be totally taken for granted, requiring no thought about safety of the deal, whether better value could be found elsewhere or hidden overheads.

What rates would the market bear if GEMs were operating alongside mature teleshopping and buyer–seller matching systems? Commissions of 4 to 5 per cent or so would probably be sustainable in many sectors, given its enormous advantages. There is, however, a radical pricing model bequeathed to us by another breakthrough in communications infrastructure: flat rate postage. Before 10 January 1840, long distance letters in Britain had been entrusted to stagecoach drivers with carriage paid, according to distance covered and number of sheets enclosed, by the recipient. A few sheets sent over a fifteen mile distance cost 4d; someone in Plymouth receiving a minimal note from Aberdeen would have to pay one shilling and four pence. Roland Hill's ambitious proposal of one simple flat rate charge of a penny for envelopes below half an ounce, between any two points in the country, paid by the sender, was considered naïve and unviable. Opponents of the Penny Postage Act of 1839, including the Post Office, also claimed householders would refuse to defile their front doors with a letterbox and that mass cholera would be spread by saliva on postage stamps.[16]

In reality, the reliability and cheapness of Hill's penny post led to mushrooming literacy. It launched letter writing for the masses as travelling workers knew they could now stay in touch and goods began to be ordered from around the country. After a short period of depressed revenue, the transformed postal service became far more profitable than before. Suppose GEMs offered all the benefits of their radically new marketplace for only 0.5 per cent, or less, of each deal? Could that similarly lead to the population transacting on a hitherto unknown scale, thereby building up volumes that would start comfortably repaying initial investment?

Creating the conditions for full scale investment

The decisive push towards widespread domestic electronic trade would require concentrated investment with profits some years away. Historically, there are three routes through which very large infrastructure developments have found finance for their swift growth phase:

- government investment
- the free market, independent of parliaments (such as bank cash machines)
- a regulatory framework laid down by government to create clear opportunity after an uncoordinated phase of pioneering development (such as roads, railways, water

supply, electricity, telephones, broadcasting).

The first is highly unlikely in today's fiscal climate. The second is certainly a possibility, although GEMs would need an extremely powerful marketing campaign to stand out from a jumble of order-taking and buyer–seller matching services on-line. Some variation of the third would offer most promise of a return on the major investment required to launch such a service. How would it be initiated? British politicians' decision to launch a National Lottery in 1994 provides a recent model: bids might be invited to establish a central GEMs computer service with full connectivity to the rest of the country. As an enticement, Parliament could legislate for a prime channel on interactive television sets (as has already been done for the established broadcasters transferring to digital systems). In addition, government would undertake to write validity for the electronic contracts that underpin each transaction on the proposed system into law. Banks may also need a legislative prod, to allow customers to trade direct from their accounts on to the system, because doing so would leave many of the 'value-added' cash management services they have in mind for on-line customers stillborn.

Government could also pump-prime the nascent GEMs system by ensuring that all purchasing and selling by the public sector was directed, initially, into an appropriate range of GEMs. Further, they should permit high level encryption between GEM users and the core because, unlike the morass of Internet order taking, the system can not support illegal trades.

By restricting this list of special treatment to the successful operators for a set period, the nation would acquire one unconfusing GEMs channel to rise above the competing claims of so many other on-line trading services. Sectors within this channel would be rolled out according to a government-specified timetable with financial penalties for lateness. Additionally, Parliament could require the system's backers to offer selected non-profit services (like voting) in return for a monopoly on official backing. They could also insist that the pact include provision of dedicated GEMs terminals to libraries and other public places so even those without interactive television, or the Internet, could open an account and start trading.

GEMs could be an appealing concept for politicians. It is a 'big idea', potentially costing little or nothing to the taxpayer, to be placed before an electorate that will become increasingly familiar with point-and-click trading and could well vote for its wider application. The terms of tender outlined above would focus on creating new opportunity not regulation. Nothing about the GEMs project would forcibly restrict other forms of on-line trade: the system's popularity would be decided by the market. Big companies could set up teleshopping systems and sell in GEMs as well; small traders might want their own Internet pages alongside their presence on the public system. The launch of GEMs would not repeat the French government's feather-bedding of its Minitel

system when Teletext was outlawed to protect the newly launched service.

The computer industry alternately fears and scoffs at the prospect of governmental involvement in its plans. Politicians are irrelevant in this global environment in the view of most industry gurus, who breathed a collective sigh of relief in July 1997 when President Clinton, faced with concerted lobbying by the industry and admitting his own technical ignorance, said that governments should stand aside from on-line trade. Campaigners for this approach had cited the breathtakingly exciting way the Internet developed, powered only by spontaneous enthusiasm among thousands of diverse developers. But GEMs do not aspire to excitement, only reassuringly solid mundanity for users who take a flow of daily transactions completely for granted. This low level of risk, in a constantly evolving marketplace, could be achieved so much more easily with precise official underpinning.

Another factor buttressing the 'governments have no place here' camp in the computer industry is a string of disasters in recent years among attempts to computerise the civil service in Britain. Expansive projects for the NHS and DSS, among others, have descended into confused objectives, overspend and recriminations. Again, the comparison is irrelevant to GEMs; the system would not be planned by politicians. A more accurate analogy is with the National Lottery, where Parliament outlined the task and left experts to complete it. Consortium partners ICL and Racal flawlessly installed gameplay terminals in 10,000 shops and trained staff between May and December 1994.

Setting up panels to enforce market standards

As well as a sympathetic parliament, GEMs need a relationship with external organisations that will vouch for the suitability of traders before they are allowed to enter a particular market sector. These organisations fit into three categories.

- Statutory bodies: these include the police, who would sanction traders for a variety of markets where proof of a clean criminal record was demanded.
- Professional organisations and standards enforcement groups that already exist: the British Medical Association, for example, would be asked to issue a GEMs compatible code to any doctor wishing to trade on the system in a professional capacity, or the Soil Association who might verify those selling organic produce.
- Verification panels demanded by those selling their services via GEMs: a group of charities for the elderly, for instance, might be asked to approve individuals wanting to offer themselves as home helps to housebound pensioners.

None of these verification schemes would be funded by the taxpayer or by GEMs. Instead, individual traders would pay the relevant body for their process of assessment just as they would for a driving test or professional examination. Obtaining verification,

however, would be much simpler than at present: a user wishing to enter the school cleaning market, for instance, would find the system advising that they require police clearance but then immediately offering to make an appointment with a local sergeant. There will be those who resent such scrutiny and they are free to look for business elsewhere. GEMs are only open to responsible traders who understand the system's commitment to a high quality marketplace.

The regulatory requirements of GEMs would be complex to set up but, as with the software, aimed at delivering an instantly dependable market for point-and-click buyers. Once the basics were put in place, each market's verification system could grow organically: Help the Aged, for example, might see demand for home help rising and see both the business opportunity and social benefit in preparing swiftly to process additional applicants around the country. They could hire potential new assessors from ex-social services staff through the appropriate GEM, if they wished.

Relationship between GEMs and the state

Government's relationship with the GEMs operating consortium would always be sensitive. New markets will require decisions on what trades are permissible, which will then determine winners and losers in the new environment. If public faith in the system's neutrality is to be preserved, those decisions must be made publicly by politicians and not by unelected GEMs management.

The secondhand book market illustrates the kind of issues likely to be thrown up. This sector would list every book published – perhaps with cover shots – and allow anyone to click on volumes they wished to sell. It would enable a user to pick up a brand new copy of a novel and, having read it cover to cover, sell it a week later through the standard contract for book sales by post. The purchaser might then sell it again and so on, with far fewer consumers purchasing a new copy. Somebody has to decide if this trade is allowed and, if not, why secondhand bookstores are not now similarly illegal. If it is sanctioned, is there a copyright payment to be added on to each sale to sustain the novelist? What about the publishers who spotted the author's talent in the first place?

There are many other quandaries: one very popular potential marketplace could be in Travelcards, allowing a user to return from multiple trips around town by mid-afternoon, then sell their All Day Rover ticket on to a neighbour who comes round to collect it ten minutes later and travels around until midnight. Clearly this devalues the point of such tickets and the issuers will argue that this trade should not be allowed but if it is GEMs management who bow to their pleadings they enter the formative stages of a dangerous aggregation of power. Another example shows how fine the judgements will need to be. Opticians could make a powerful case for a GEMs spectacles market excluding or penalising ordinary myopics wanting to sell their glasses secondhand. (The market inter-

face would simply ask users to input their head size, click on their prescription for either eye, then select a frame style they wish to sell or range of frames they might buy. Transfer from seller to buyer would be by post.) Would the professionals' pleadings be granted in pursuit of the highest standards of eyecare nationally, or dismissed as naked self-interest? Like the more straightforward Travelcards ruling, that is a political decision to be made outside the GEMs consortium.

The need for regulators

Government would also need to put a regulatory department in place, funded by a levy on the new system. These IT literate inspectors would monitor security and privacy of information while keeping a watching brief for complaints of market manipulation. This kind of tampering in a sophisticated electronic market can be hard to identify. Random test transactions by inspectors, rigorous sleuthing through the software after any customer complaint and the promise of substantial fines should deter all but the most corrupt among operating staff.

The operating consortium would be in a uniquely sensitive position because of the natural monopoly of their service. Public trust would be to the GEMs business what safety is to airlines; a fundamental priority that transcends short-term commercial imperatives. Users must trust the system without question to find them the best deal without distortion and protect their privacy or there may not be a business to run in the long term. However, operators would have little incentive to skew market activity as income is proportional to turnover not sales from any particular source.

GEMs would be launched to a public more cynical than ever about standards in public life. Past models of private enterprise regulation, like Britain's OFTEL, might not be sufficient. Could an OFGEM really be counted on by users of something so complex and pervasive? Management should proceed on the assumption that it could not and consider themselves on a permanent mission to assert the system's neutrality, security and dependability.

Total transparency of operation could be guaranteed through a *GEMs – log of activities* page on the system. Here any user can see the system's proceeds being amassed, penny by penny, as it extracts commissions through the day from each sector. There would also be space for any alerts generated by the core software to say when it was being tampered with. Any attempt to interfere with an individual user's data, however remotely, must also trigger warnings to that user next time she logs on; inevitably there would be false alarms requiring explanation, but that is preferable to users who suspect that personal accounts or trading preferences were not under their sole control. Monitoring software would publicly log daily maintenance and changes to computer settings and, again, automatically file reports on the Log of activities pages. Additionally, a publicly available page could be set aside where 'whistleblowers' internally could use

their GEMs staff verification to write anonymously of any concerns they have about company standards.

This still might not be sufficient. Some potential users will simply not trust large computer networks. They should be reassured with additional human scrutiny, from sources that transcend government and civil servants. Aside from the proposed OFGEM's own inspection regime, its civil servants could be charged with assembling an ever-changing roster of domestic and international bodies, from across the ideological spectrum, to perform ad hoc inspections. These would be paid for by a levy on system income and could involve, for instance, Amnesty International appointing consultants to analyse the operation this month while US Republican Party nominees do the same four weeks later. Both would publish their findings direct to the public and, apart from any additional observations on market operation from their particular perspective, would be charged with answering the simple question: is this core computer service doing everything it is claimed to do and nothing more? If the answer ever came back as 'No', GEMs management would find out at the same time as the public. The aim is to avoid any suggestion of a regulatory cabal and ensure constantly imaginative attempts to outwit any dishonesty.

Security precautions as comprehensive as this may seem excessive. But, again, there are parallels with airline operation. Beginning every journey on the world's safest form of transport with cabin crew preparing passengers for a crash may seem unnecessarily pessimistic, but it reinforces a safety consciousness at the heart of an entire industry. Certainly the early GEMs operation should not have to burden itself with all the measures outlined above but, as the system attracted increasing trade, the consequences of any impurity would be more and more disruptive to both the national economy and the consortium's own business prospects. Far-sighted management would publish a timetable of integrity checking procedures to be phased in as the system's percentage of domestic trade grew.

Role of the courts

An increase in transactions brought about by GEMs would mean more work for the judiciary. Some of the contracts issued by the system will, inevitably, go to dispute and need to be resolved promptly so that the system is not clogged with traders awaiting judgement. But GEMs' incentivised market structure would do much to minimise cases requiring court arbitration.

Take, for instance, a home owner dissatisfied with the service provided by a window cleaner hired in GEMs. She will instigate a complaints procedure on the system and payment will be frozen. The window cleaner, alerted by his GEMs terminal, will probably return and complete the job to his customer's satisfaction but, if feeling unjustly accused, might tell the system he does not want to trade with her again. If the house

owner refuses to clear her complaint, neither of them get the money; it could be paid into a charity fund. However, if one decides to sue the other for payment, GEMs will invite both to type in their version of events and route all details to small claims court where judgement will be enforced after a point-and-click from the bench.

The system would have mechanisms to discourage wilful complainers. If three established window cleaners in succession were to tell the software they no longer wanted a householder's business, GEMs might bar her entry to that marketplace. If she repeated the behaviour with gardeners it could refuse to let her trade in the whole *Household services* market for a while or even de-list her completely. PINs would only be issued against proof of identity, so acquiring a new identity on the system would not be an option. Like all punishments for unreliable behaviour within a GEM, it would be firm but applied fairly by impartial software. There would be no one to hear mitigating circumstances, except a judge who would be working within laws designed to allow GEMs to flourish and might award costs if malicious complaint was proven. A GEMs system must be able to promptly purge itself of sub-standard traders, just as bad drivers are excluded from the roads, but saddling the business with staff to review individual pleadings would be an unacceptable overhead on the markets. It would also threaten GEMs' neutrality.

Enforcement of good behaviour on disparate sellers

Similar checks would prevail with contracts in which goods are posted between users. Deirdre in Dundee could be looking for a very specific camera and finds herself matched with Norman in Norwich who has that model for sale secondhand. The contract between them might hold payment in escrow for a week, in which time Norman must post the equipment. Let us assume that Deirdre instigates a complaint procedure on the seventh day, claiming nothing has arrived. The money would be frozen. She could be making that claim maliciously but there is little point, as she would not get her money back. If Norman forwarded the case to court (possibly producing a witness who saw him pack the envelope and put it in the post), Deirdre would face costs plus a black mark against her on the system.

It is more likely that any complaint would have some germ of truth: the camera being inaccurately described perhaps or posted later than promised. Whenever a complaint is instigated the software would offer the other side a chance to accept culpability. If they did so, admitting the camera's condition was overstated for instance, the system would impose a fine according to a published scale; refunding 25 per cent of the price back to the buyer maybe, with no further penalty. If, however, the case did come to court, the guilty party would receive a stiffer penalty.

What core competencies are required to run GEMs?

Telecommunications companies, consumer marketing firms, software houses and hardware manufacturers all have core competencies that they are keen to apply to the online economy. But none of them have a track record in managing the minutiae of presentational issues that would make up daily routine in GEMs offices. Although judgements about which markets are allowed would be decided, ideologically, by the government of the time and decisions about market standards would be taken by a relevant trade association or charity, the way options are prioritised and presented falls firmly on GEMs staff. Take the pet care market for instance, which would enable animal owners to hire someone locally to care for their creature while they were away. The government might decide (uncontroversially in this case) that only users over fifteen years old who had been able to prove that they had no conviction for animal cruelty were eligible to offer their services and the sector was outside minimum wage legislation. The RSPCA might be invited to set standards and then impose grades that could start with a probationary period limited to fish, mice, gerbils and similarly undemanding clients before a trader can move on to cats and dogs. They might want to mandate an hour of first aid training from a local vet (paid for by the trader of course) after 400 hours of bookings before grade three can be attained and restrict the top grade to individuals with a veterinary nursing qualification. Even with these ground rules in place there is still much to be decided by GEMs staff. In the standard contract what are the implications of a trader being bitten? How would data be displayed for the market overview? And so on.

There are few clear cut answers to such questions; many are editorial decisions, the tone of which will determine the system's relationship with its public. Each market sector will have to be run by a responsible individual who will write the user interfaces only after acquiring a deep understanding of traders in each sector, of how trades in a sector are constructed and how relevant buyers and sellers prioritise their search for value. We might call these people 'producers' because, as with their television and radio counterparts, the job involves researching an area of activity and then presenting it to a diverse audience in a way that is easy to understand but impartial, while making full use of engaging presentation techniques.

There is room for flair in the facilities offered. Returning to pet care as an example, that GEM could have a bank of multiple choice questions about animal management, twenty of which could be sat, via the system, every week by any juvenile entrant for six weeks before entering the market. If they answered correctly, that reassuring seriousness of purpose could earn entry at a marginally higher grade. To be avoided is the timidity with which the BBC inaugurated television news: for years newscasters remained off-screen, in case they reacted to a story with the faintest of facial gestures, and read only sparse copy confirmed by more than one news agency. It took ITV news to demonstrate how a confident editorial stance can enhance both integrity and clarity.

GEMs would not be an entertainment medium but they should be willing to try anything that makes their markets more attractive or raises the standards of traders. Information presented to users, however, must always be prioritised: the important questions in highlighted areas of the screen for buyers just looking for a quick transaction, more imaginative options in side displays for those with more time to shop.

The relationship with wide-ranging external verifying organisations would be critical. Without these bodies involved in relevant markets the system would lack the authority to reassure, say, pet owners that their particular GEMs were soundly constructed and thoroughly administered. Additionally, these relationships are essential to preserving GEMs' neutrality and corporate responsibility; system staff should not be given the far-reaching power to structure thousands of marketplaces. But dealing with such varied groups will be demanding: many will probably know little of electronic trading and will need considerable guidance. Despite the financial prospects of verifying traders and arbitrating in disputes, they may not wish to take part, in which case other organisations would need to be cultivated, and so on. This process, again, bears comparison with inducing organisations to appear in television programmes.

Because of this expertise and culture built around editorial independence, one or more media companies would be likely to be a prime mover in any successful GEMs launch. The hardware, programming and connectivity, though undoubtedly demanding, would be less high profile issues that could be resolved by other members of a consortium. To further erode fears of some monolithic combine taking over the nation's electronic trade, the consortium might confine itself to running only the core programming and protection mechanisms, while 'front end' marketplaces would be written and designed, within a house style, by franchised production companies. Anything that further devolves the formidable and usage-inhibiting power that GEMs' central companies could garner would need to be seriously considered.

Likely opposition to this project

'The Tory press seemed sulky,' Roland Hill wrote in his diary on the day his scheme to bring the advantages of a postal service within everyone's reach was launched. Some 160 years on, interest groups and ideological opponents of a new infrastructure could muster much more intrusive opposition. GEMs could pose a serious threat to an intimidating potential coalition of interests.

- Service organisations: hotel companies, for instance, would find themselves in competition with ordinary householders around the country whose rooms could be let out by the night, to responsible customers, at times that suited the owner.
- Retailers and agencies of all kinds could likewise lose the dominance they have expected to hold in the era of on-line trade, ultimately many of them could lose any

reason to exist.

- Manufactures of low-use goods – certain home accessories, specialised sports equipment – could see soaring usage of their products accompanied by decreasing sales as a reliable hire market becomes more convenient and cheaper than purchasing.
- Banks, credit card companies and financial service suppliers are all aware of the profit potential of on-line trade. Because GEMs would exchange secure payments directly between users' accounts, these transaction charges would be obliterated.

The industries needed to build a GEMs system might also be cool about the notion of GEMs.

- The software industry, currently bullish about a future selling an array of competing, fragmented, 'solutions' to organisations with varying commitments to going on-line could be largely sidelined if all companies had access to a comprehensive range of electronic markets, with no set-up charge.
- Telecommunications companies own the networks that would carry signals between the core computer system and its users. But a GEM transaction can be resolved at high speed, rather than through prolonged communication – contacting multiple on-line vendors or the lengthy process of calling sellers found in classified advertisements or Yellow Pages.

Getting the message across for GEMs' opponents should not be a problem, as the communications industries would be their natural allies.

- Advertising and marketing companies would have to rethink their function in an economy based around GEMs, which will always find the best value for each individual customer's search, and provide full trading records to enable a rigorous personal assessment of buying options.
- Publications and broadcasters could be concerned at a potential threat to advertising revenue.

Historically, the introduction of new infrastructure projects has often involved tough battles. Certainly, GEMs' opponents will have a rich vein of negative imagery to exploit. 'Big Brother' and fears around state-sanctioned monopolies could be invoked, as could the consequences of a system breakdown and loss of jobs among businesses affected by GEMs. None of these attacks would be unanswerable. The question about 'Big Brother' is no longer whether we soon want to be interacting with sophisticated centralised computer systems as part of our daily routine, but in whose interests are those machines going to be programmed? Complete breakdowns are only a remote possibility: SABRE and its competitors have demonstrated failsafe back-up systems over decades of

operation. Finally, the jobs that may be lost because of GEMS are not necessarily mainly those at shopfloor or call centre level, many of which will become redundant if teleshopping is successful anyway, but executive posts in depleted service organisations.

If momentum towards a GEMs tender were to become unstoppable, opponents might shift to a campaign for limiting the concept's potential, creating two-tier markets, for instance, where established businesses are given preferential treatment compared to smaller newcomers. A response to this argument might be that any country wanting to launch such a restricted GEMs scheme would quickly be overtaken by other nations which realised they could move beyond existing power bases into a new era of genuinely open markets. Given the range of interests affected by the GEMs vision, getting a hearing for these responses may not be easy.

Conclusion

The advent of electronic trading is pushing developed world capitalism to a crossroads. We could hurtle towards a relentlessly 'market-led' world of corporate re-engineering and narrow gains in productivity where powerful companies, relieved of the need to employ anything like the numbers they do at present, continuously build on their advantages in the marketplace. Alternatively, individuals could be given the option to trade in a customised inclusive marketplace open to all.

Politicians need to appreciate that winners in the free market of today have no incentive to create a new free market for tomorrow. Major players of the moment will tend to build only those futures they feel they can dominate. If the true economic and social potential of electronic commerce technology is to be liberated, government must become a prime mover in the revolution.

The first country to make this new marketplace fully available to its populace will gain enormous international advantage. Britain once achieved global prominence through its government's response to the opportunities offered by canals, railways and cheap postage; we could yet experience the same effect in the electronic trading revolution.

Appendix

principles governing guaranteed electronic markets

Inevitably, as point-and-click purchasing gains acceptance, systems will be launched purporting to offer the technology as a neutrally applied service for all. That will be a difficult claim to test objectively because there is little public awareness of the full applications of electronic markets. Additionally, any such service will be under immense outside pressure to limit its true usefulness on one hand, but, on the other, to rise above background babble in the cyber-marketplace by making unrealistic claims of what it can offer.

A system truly for mass benefit will be dedicated to ever widening, manifestly non-partisan, marketplaces: available to all, but forced on none. Management will have a realistic relationship with users, recognising that the enormous positive potential of the technology is accompanied by possibilities for market distortion and invasion of privacy that can be hard to detect. Mankind has never had a relationship with a mass technology as intelligent, and potentially all-pervasive, as would be the case with GEMs. This sensitivity requires new rules; they may appear fearsome in their demands on backers but would be phased in over several years as the system grew.

The following five principles are excerpts from a wider attempt to define such a system. If any future national electronic marketplace does not match up to them, that population has been sold short, and the international advantage that this technology has to offer will flow elsewhere.

1. The system is programmed to enforce fair trade

- Responsible buyers and sellers are able to prove their status to each other, while sanctions are imposed on sub-standard traders.

Each transaction is thoroughly enforced:

- Payment is deducted at the point of purchase but held until such time as it is clear the contract has been completed and no complaint procedure initiated. In some cases (such as the decoration of a house), this may entail release in tranches as the buyer approves each stage of work according to steps laid out in the standard contract.

- Providers of services must pay a bond into the system determined by the liabilities they could incur. GEMs have a duty to set up insurance markets that will match traders looking for bonding with underwriters, who can have their commission deducted from each transaction automatically. Traders receive interest on their bonds.
- The system proceeds automatically on receiving complaints about a trader. It offers every encouragement to both sides involved in a dispute to click on a mutually acceptable resolution that it can then administer.
- The system does not allow one trader to be in debt to another, except in its loans market where lenders can assess the level of risk they are willing to accept.
- Every deal must have a counterparty who can be brought to book in the country of operation. If trading foreign holiday accommodation for instance, the seller must be a company or individual registered as a system user, bonded and available for redress.

Market conditions are structured around the needs of buyers, rather than favouring particular sellers:

- Full comparisons (for instance, cost per litre for various sizes of wine bottle) are always available.
- The standard contracts include a 'no unsolicited approaches' clause. Users can buy from increasing numbers of traders without fear of direct electronic mail.
- Once a contract is signed, any costs incurred because the seller can no longer meet obligations are met by the seller.
- Tougher conditions are imposed on probationary traders. A lorry driver in his early weeks, due to pick up a vehicle at Watford Gap Services might have to arrive, and sign in on the location-specific terminal there, 60 minutes early so there is ample time for the software to hire another driver if the probationer does not log in.
- For legal purposes, the system will band together buyers who complain about a particular seller.

Everything possible is done to attract wide-ranging sellers into the marketplace:

- Sellers are able to formulate exactly the return at which they are willing to trade through a pricing formula with multiple parameters that they can adjust constantly.
- Companies can have their stock control computer interfaced with the GEMs system to allow constantly updated inventory into the marketplace.
- GEMs does not seek to impose uniformity on sellers. Standard contracts (which can be changed) mandate reasonable standards of participants. Any seller who wants to change their contract to offer better than standard terms will have that reflected in their display to potential purchasers. For example, a user looking to get a roll of film developed would see immediately the standard contract provided only for replacement of the film in case of processor negligence, but could click at the beginning of their search to

see developers who carried much higher insurance for irreplaceable material.

- Cumulative selling is enabled. So, for instance, a swimming pool manager could tell the system his facility would open late in the evening once a minimum of twelve buyers paid for an hour in the water. The system will always tell prospective buyers what the required figure is and the number of currently confirmed takers.

2. The system is committed to maximum usefulness

- Ultimately, there should be a market for every sector of legal trade in the country of operation.
- Additional social applications of the technology, including the potential to boycott certain sellers and the ability to launch plebiscites among defined groups of users must, eventually, be made available.

Each market must deliver the full benefits that electronic markets technology has to offer that sector:

- Each GEM has a person in charge. They are knowledgeable about the technology and core software available on the central computer system and in constant touch with their market. As volume increases in their sector they must look constantly for refinements to add.
- The system trades in units of need not sources of supply. Someone looking for a place to stay in a city, for instance, would be able to see hotel rooms, guest house accommodation, private bedrooms for hire, even surplus accommodation in universities and hospitals that night all compared according to their personal priorities.
- Markets should cater for the smallest possible units of need so, for example, anyone seeking a child's paddling pool could access not only purchase options but a hire market for anyone who wishes to rent a pool out.
- Likewise, packages are discouraged. Any seller can offer complete holidays, for instance, but it is likely to make them uncompetitive when the system can pull together foreign accommodation, flights, insurance and transfers according to a buyer's individual needs from multiple vendors.
- Contractual chains can be constructed among traders who are willing to accept bonding that will cover costs of rescheduling the chain if they default.
- Users can enlist 'Autobuy' functions: for instance, a hospital manager could tell the system she will purchase 500 new cotton sheets if the price ever falls below a certain level.
- 'Auto-ordering' is also available so a soft drinks company that is selling its spare bottling line capacity on GEMs could additionally tell the system to hire automatically the required staff for any booking and only finally confirm the order once it has been able to do so.

The system is committed to simplicity of operation for users:

- As each user becomes familiar with GEMs the number of key strokes in each transaction can be reduced. By displaying a symbol for 'standard contract not amended' against purchasing options for instance, buyers do not then have to call up the contract before signing. Likewise, a trading record can be expressed as a percentage, based on a standard formula that factors number of assignments, number of customers and number of complaints: this would enable easy comparison between sellers.
- Ways of loading options for sale into the system must be constantly made easier. For example, the system should be able to recognise every barcode on every product ever sold in the country of operation. Anyone wanting to sell food, books, records, clothes, toys, furnishings and so on need only find a barcode reader connected to the system to swipe in full details of their inventory which will then be displayed on screen.
- A range of simplifying templates should be offered: for instance, a list of components for a wedding, with currently available prices of each element displayed alongside. Additionally, large markets can be offered in scaled down form for hurried purchasers: someone looking to order the ingredients of a meal need not click their way round a virtual supermarket but could call up a virtual corner store where only a minimal selection would be displayed.
- Every commitment a user enters into on the system is confirmed back to him for final approval to avoid input errors.

The way options are displayed is constantly advanced:

- Information is to be presented in the most graphic way possible. Sellers should be offered opportunities to individualise interactive displays; for example, cinema managers would be able to create a seating plan of their auditorium that could be used for buyers to select seats for each showing. (The system would allow movie goers to click on a film title and see a map of cinemas in their area showing it, then call up available seating for each of them.)
- Options within a market can be merged according to a user's instructions, for instance, adding cost of delivery into options for the hire of a tent for a weekend so each piece of camping equipment is displayed with an overall price at that point in time.
- Goods and services are displayed in all sectors for which they are relevant. For example, someone launching Learn to Fish Holidays would find them being offered to interested parties accessing markets in Further Education, Sporting Facilities and Countryside Holidays.

The system is committed to low overheads:

- Electronic markets must be cheap to be truly useful. Although fully featured, they should be seen as a mass medium, one in which staff are not involved in any individ-

ual transactions. Management's task is to ensure that there are external mechanisms to deal with trades that go awry and provision for funding of those mechanisms within the terms of each user's acceptance into the market.

- GEMs do not offer any function that requires human judgement on a day-to-day basis. The system can operate (if permitted) a range of lotteries, for instance. It would take in funds from users and pay out winnings, after deducting its own flat rate commission, according to a random number generator. But the system itself cannot operate as a bookmaker because the setting of odds requires daily judgement; it is up to users to provide a market-making facility.

3. The system's neutrality is to be aggressively asserted

- GEMs are constructed only to enable the best possible match for each buyer's enquiry: there is no other agenda.

The system stands alone, divorced from political ideology or vested interests:

- Operating companies and staff must declare any business activity or political affiliation that gives them an interest in a particular market; this information is to be openly available to users.
- Because of the danger of an unrepresentative elite emerging to run the system, senior staff are only allowed to work in day-to-day management for an eight year period, after which they can become GEMs consultants, relinquishing hands-on control.
- There are to be no favoured means of access to the system: it can be carried by any cable company, Internet provider or similar channel that can match required security standards.
- No outside body that is regulating a market on the system is to be allowed to use their involvement to propagate a particular ideological view of that market. In particular, the system does not pursue regulation to the point where it bars innovative 'fringe' traders from GEMs. For example, if registration of therapists was ever to be introduced, that GEM would still allow unregistered practitioners to trade while making the distinction clear.
- Any decision that can practicably be made by users collectively, rather than by management, is to be resolved that way. The boycott function, for instance, would be offered when 2 per cent of users put in a written request to exclude sellers from their matches on specified grounds. Management does not decide when to offer a boycott facility in any particular market.
- The system is open to any reasonable form of interface that users wish to use. If customers wish to pay using smart cards, for instance, the core software must recognise that input.

The system has no other purpose than provision of electronic markets and immediately related functions:

- The GEMs brand name is not be to be applied to any other service that could dilute its integrity.
- A market in peripheral services could grow up with GEMs: digitising trader's photos and sending them to the central computer for instance. Beyond ensuring that access is available to any company wanting to provide this service, the consortium should not get involved. As a rule of thumb, no one employed by GEMs is ever to be involved in an individual transaction, otherwise the operation becomes too unfocused and has too much potential for misplacing trust.

No one is to be coerced into using the system:

- Management must not permit any attempt to make use of the system mandatory, they would for instance not cooperate in plans to compel anyone to file tax returns though GEMs. (Tax authorities can choose to offer a bonus to GEMs users who wish to file authenticated returns in this way, however, but it is always the individual's choice.)
- GEMs are not to be used as a social order device, requiring offenders to sign on at a certain time to prove they are abiding by a curfew, for example.
- Any user can sign off the system at any time once all their contractual obligations have expired. If their parallel economy account matches the number of points they were awarded on joining then no record is kept of their membership. If they have spent their points, minimal details are kept to ensure they do not receive a fresh supply on rejoining.
- The system does not set out to limit access to any other on-line service, by stipulating monopoly carriage to cable TV companies for instance.
- GEMs offer potential for reducing welfare costs, but over-enthusiastic application must be resisted. For example, the system will provide a market in places in hostels for single mothers and, obviously, has no way of knowing which of its users are only seeking such accommodation under pressure from housing benefit officers. This particular market would be supervised by a group like the National Council for Single Parent Families; if users report being forced unreasonably into the market the Council has a duty to alert GEMs management who can insert a warning on their own 'Information For Users' pages that should then make the enforcement an issue on which the government can be held to account.

All adult users are treated equally:

- All sellers must submit to GEMs' verification, bonding, escrow and contract procedures, regardless of their size or trading background. This is an automated market which makes no exceptions for big brands or companies pleading exceptional reputations.

- No one earns preferential treatment in the GEMs marketplace through spending power, frequency of use, type of business or ideological viewpoint. The only exception is emergency services; a verified doctor needing an item of equipment, for example, would be able to click on a 'rush' icon and jump any other users in a queue for available deliverers at that time.
- Junior users must be restricted in terms of the trading responsibilities they can take on (only being able to agree a contract with a parent's PIN as counter signature for instance) and in the sectors they can access.
- The homeless must not be excluded from GEMs because of their lack of a registration address. However, they do need to be accountable for any trades into which they enter. Charities should be able to vouch for individuals who can then approach underwriters in search of a bond that will enable them to start building a trading record.

4. The system has responsibilities to the society in which it operates

In recognition of the importance a mature GEMs network could acquire within the national economy, management have a special duty to run the system responsibly:

- Unquestioned reliability for all users is at the heart of this project. The operating companies must bear liability for any errors caused by their software; if an oil company, for example, offer 1,000 barrels of crude in the appropriate GEM and the central computer inadvertently sells 10,000, GEMs' management (or their insurers) will have to buy the additional 9,000 barrels elsewhere to fulfil those orders at the original price. This responsibility, combined with the need to maintain standards of supervision and regulation in each market, requires a close relationship between companies who provide the GEMs service. The concept could not work as an open standard which any software firm could license as a foundation for their own offering. However, if the system is to enjoy rapid growth to its full potential, countless enterprises need to be welcomed under the umbrella of GEMs' regulatory structures and risk acceptance. The relationship with these companies should be akin to that of a franchiser and franchisee: a firm that, for example, wins the tender from GEMs management to write, and then oversee, the market for dentists' appointments nationwide will have to abide by the need for outside regulators, constant market users' input and responsibility for errors common to every sector.
- The system itself must be soundly financed with ample revenue protection devices, to stop traders using it to list services which are then traded by other means.
- Any change to system pricing structure must be flagged to traders well in advance.
- Despite the commitment to user privacy, some sectors should track sensitive purchases: guns, pelts, rare animals or explosives for instance. These transactions will generate a data shadow enabling, say, a particular gun's ownership to be traced back for years if

police gain a court order to open its records. Users will always be informed when these records are being compiled; honest purchasers, of course, have nothing to fear from the process.

- GEMs' technology could eventually be applied to sensitive social work, matching foster children and approved parents for initial meetings, for example. This should be provided through closed markets, only available to foster parents and social workers.
- Provision must be made for checking traded items against a police administered list of stolen goods.

GEMs could, in time, become part of the checks and balances of a democratic society:

- Like a healthy press or broadcast industry, GEMs should keep its distance from government. Management must be relentless in their focus on rolling out unimpeded benefits of trading technology unless restrained by law: there is to be no backroom agreements with anyone. All meetings between management and interest groups or politicians are recorded on the system's pages, with all decisions reached at such gatherings announced in the same way.
- Where the system's usefulness is restricted – by government limiting trade on GEMs that is legal in other forms for instance – management must alert users that they are trading in a hobbled sector.
- Advice should be given freely and publicly to politicians about issues they will need to resolve as new markets are rolled out. They might, for example, want to restrict the raw meat market to licensed butchers on public health grounds, and will need time to develop and enact legislation.
- The system could acquire a pivotal role in the nation's money supply and must be subject to – publicly issued – edicts from the Chancellor. In particular, there is a danger that the efficiency of the GEMs loans markets could create an unprecedented multiplier effect in cash circulation. Parliament may want to dampen this with laws mandating minimum periods of borrowing.
- A GEMs system's own pages for users should include an annual management report on how free the system's own markets are, compared to other forms of legal trade in the country of operation. In a non-democratic country this page needs to state that trade on the system is government controlled.
- The only exception to the foregoing is at times of national emergency. GEMs recognises its potential usefulness in a crisis, helping orderly evacuation of a city for instance by allocating places on trains or pick up points for coaches while issuing codes to residents of a particular zone who are to be allowed through roadblocks. Like the broadcasting networks, government could take over the system in a crisis although GEMs would not bear the costs of setting up this emergency programming which should be

met from civil defence funds.

GEMs have responsibility to existing organisational structures:

- The system is not opposed to any form of doing business and will do everything – short of crippling its own potential – to accommodate existing organisations into its marketplaces. It should give businesses time to react to the impact of GEMs by announcing clearly what it is going to do and when, well in advance.
- Charities are entitled to special treatment on the system. Uniquely, they can operate as retailers so, for instance, a user could do all their Christmas shopping from the NSPCC via GEMs.
- Brands, too, are to have their status preserved and they should be displayed in illustrative material supplied by the maker (but not allowed to mislead in any way).
- The system has a duty to encourage innovation, writing new market sectors whenever a genuinely innovative product category is launched.
- Without lowering its commitment to political neutrality, the system recognises the desirability of according certain status to some government functions. If Parliament were to launch a referendum on the system, for instance, it must be showcased on the voting page, not simply listed amidst polls launched by ordinary users.

5. Maximum security is an overriding priority

The software itself has automatic triggers that warn of any security breach:

- Wiping of spent data or of information which a user has cancelled must be irrevocable. In the case of personal preferences the system must wipe information rather than reveal it to anyone other than the user.
- Remote access to internal programming is not possible. (Just as a bank's core computer programming can not be rewritten from a cashpoint.) Instead, physical presence is required in a control room where accessing the core programming requires human checks modelled on protection for defence systems.
- As the system increases its volume of trading, management should allocate a significant percentage of profits that would be available to any hacker able to penetrate all the security precautions. This self-imposed fine would ensure that corporate focus never shifted from the need for updated security and reassure users that, even if the system were to be penetrated by an outsider, that person would be unlikely to waste their time browsing individuals' files.
- Any user who fears their communication with the system is being monitored through a tap on the phone line can make use of a room at the GEMs building which allows direct access to the core by nervous users (who may be running a sensitive, but legal, political group on the system for instance).

As a natural monopoly, with so much potential for difficult-to-detect interference, the system is too sensitive for regulation by any one body:

- A GEMs consortium that has been sanctioned for monopoly of government approval must recognise it has forfeited rights to normal commercial secrecy; it has no comparable competitors, while demonstrable integrity has become its most important long-term asset.
- Tough, and increasingly ingenious, inspection is to be welcomed – the system must genuinely have nothing to hide and everything to gain from showing its willingness to be examined by inspectors with a range of ideological viewpoints and technical expertise.
- Management should recognise that security is as much a human as a technical consideration. The consortium must encourage a culture of openness and recruit from all sections of society. In particular they should:
  - place no restrictions on staff talking to the press if they have concerns about the system's probity.
  - accept that mistakes will be made; there could be inadvertently skewed markets, for instance. When that happens a full account of remedial action must be published on the system's own pages promptly.

Security of individual trades is an equal priority:

- No one can use the system without an identifying password or PIN. These can be changed whenever a user believes her personal security might have been breached. Additionally, users can opt for an array of passwords, insisting on an additional word for trades over a certain amount for example. Partial-access codewords can also be generated; a frequent motorist, for instance, might have a codeword that allowed a colleague to access his account, but only for a restricted one-off visit to book a mechanic in case of a breakdown.
- Apart from an automatically compiled trading record, the system does not hold any file on users which they cannot control fully. When John Smith is verified by his local police station to enter the home security market, the sergeant's endorsement is not sent to a GEMs file of external assessments of Mr Smith. There is no such file. Instead, the GEMs computer issues a code to the sergeant; he relays this to Mr Smith, who can then input his new status into his user questionnaire. The crucial point is that the only information the system knows about him is what he has told it (with proof via a code where required); no one else can input information about him.
- A seller can only obtain information about a buyer which the buyer chooses to reveal.
- Companies can assign levels of purchasing responsibility on GEMs to individual employees. But those workers are held liable for any irresponsible trading; a solid GEMs trading record should be as attractive to employers as a clean driving license.

Notes

1. www.polysort.com

2. cyber.café, ITV, 26 June 1996.

3. *The Economist*, 20 August 1994.

4. Figures supplied by Office of National Statistics (figures exclude wholesaling).

5. Interforum, 1997, *Commercial opportunities and threats in the networked economy*, Interforum, Richmond.

6. Real Estate Market Space: http://remarket.com/index2.html

7. Computers On Line: www.gndi.com/cgi-win/micro9.exe

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