An Assessment of the Social and Economic Cohesion Aspects of the Development of the Information Society in Europe

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An Assessment of the Social and Economic Cohesion Aspects of the Development of the Information Society in Europe:
The Portuguese Contribution

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SUMÁRIO


O estudo engloba uma visão da emergência da sociedade da informação e dos desafios que esta apresenta para a Europa e descreve a estratégia que foi desenvolvida pela União Europeia, ao mais alto nível político, para se ajustar às profundas mutações que a sociedade da informação irá gerar e simultaneamente procurar encontrar um caminho de liderança na indústria das tecnologias da informação e da comunicação em relação a países terceiros.

Um aspecto relevante da contribuição portuguesa foi o desenvolvimento de quatro casos demonstrativos das implicações da sociedade da informação, correspondentes aos sectores leiteiro, do turismo, do calçado e da saúde. A metodologia adoptada baseia-se na análise da cadeia de valor.

O estudo engloba ainda uma contribuição ao nível do direito das telecomunicações em que é analisada a legislação e a regulamentação portuguesa neste domínio, numa perspetiva da coesão europeia.

ABSTRACT

The aim of this paper is to consolidate the Portuguese contribution for the European Commission study “An Assessment of the Social and Economic Cohesion Aspects of the Development of the Information Society in Europe” which was completed by a European consortium led by Nexus Europe in which ISEGI- Instituto Superior de Estatística e Gestão de Informação, Universidade Nova de Lisboa, is a national partner.

The study includes an overall view of the emergent information society and describes the challenges that information society poses to Europe, as well as the strategy that the European Union has developed at the highest political level to accommodate the important changes that the information society will provoke. Simultaneously, it describes the attempts of the European Union to build a leadership in the information and communication industry.

An important contribution of the Portuguese team has been to explore four case studies to show some of the implications of the information society in the sectors of diary, tourism, footwear industry and healthcare. The analysis was accomplished through a value chain methodology.

The study contains a contribution on the Portuguese legislation and regulation for the telecommunication sector in the perspective of the European cohesion.
Cap. 1

A SOCIEDADE DA INFORMAÇÃO
1. Introdução


O estudo engloba uma visão da emergência da sociedade da informação e dos desafios que esta apresenta para a Europa e descreve a estratégia que foi desenvolvida pela União Europeia, ao mais alto nível político, para se ajustar às profundas mutações que a sociedade da informação irá gerar e simultaneamente procurar encontrar um caminho de liderança na indústria das tecnologias da informação e da comunicação em relação a países terceiros. Estes temas são desenvolvidos no presente capítulo.

O capítulo 2 versa sobre um dos aspectos mais relevantes da contribuição portuguesa para este estudo que foi precisamente o desenvolvimento de quatro casos demonstrativos das implicações da sociedade da informação, correspondentes aos sectores leiteiro, do turismo, do calçado e da saúde, seguindo uma metodologia baseada na análise da cadeia de valor.

O estudo engloba ainda no capítulo 3 uma contribuição relevante ao nível do direito das telecomunicações em que é analisada a legislação e a regulamentação portuguesa neste domínio, numa perpectiva da coesão europeia.

Finalmente, este trabalho inclui em anexo a resposta enviada pela equipa nacional a um questionário elaborado pela equipa central do projecto na fase preliminar do seu desenvolvimento.

2. A Emergência da Sociedade da Informação

Ficaram para trás na escala do tempo as ‘Sociedade Industrial’ e mesmo aquilo a que se convencionou chamar as ‘Sociedade Pós-Industrial’. As manifestações da ‘Sociedade da Informação’ rodeiam o nosso quotidiano, afectam o comportamento das organizações e determinam o pensamento estratégico das nações.

Mas afinal, o que significa a ‘Sociedade da Informação’? Porque razão é que as empresas alteram o seu curso e as nações têm necessidade de reflectir estrategicamente em função deste novo estádio da sociedade? Como será que se pode retirar o maior proveito possível da revolução da informação em curso? Será que estamos em condições de também poder beneficiar desta nova forma de organização da sociedade? Haverá barreiras a transpor e estarão estas ao nosso alcance, ou seja teremos a vontade e a energia para a transpor? O espaço geopolítico em que nos inserimos tenderá a reforçar a sua coesão em função do desenvolvimento da ‘Sociedade da Informação’ ou as forças subjacentes ao crescimento desta última
contribuirão para cavar o fosso entre os países do pelotão da frente e aqueles outros, como Portugal, que estão na pegada dos primeiros?

Muitas mais perguntas poderiam ser formuladas em relação a essa enigmática ‘Sociedade da Informação’ que ameaça invadir os nossos lares, alterar o nosso comportamento, mudar o modo como nos divertimos, afetar o emprego, o tempo de lazer, a acessibilidade do espaço urbano e rural, enfim mudar o mundo em que nos habituámos a viver.

A raiz profunda destas mutações encontra-se num conjunto de inovações tecnológicas cuja origem remonta a cinquenta anos atrás e que não tem parado de intensificar o seu ritmo de expansão. A história começa com dois investigadores Atanasoff e Berry que em 1942 inventaram uma máquina constituída por componentes electrónicas e outras de natureza eléctrica que era capaz de executar cálculos numéricos e que recebeu por analogia com os humanos que realizavam semelhantes cálculos, na terminologia da língua de Shakespeare, o nome de computador. Em homenagem aos seus criadores este primeiro computador electromecânico ficou conhecido por ABC (Atanasoff and Berry Computer).

Em breve seguiu-se o primeiro computador electrónico. Desta vez coube a dois investigadores John Mauchly e J.P. Eckert da ‘Moore School of Electrical Engineering’, Universidade de Pensilvânia, EUA, que em 1945 criaram o ENIAC.

Muitas outras inovações se seguiram. No início da década de cinquenta é introduzido o transistor, mais compacto e fiável que as válvulas electrónicas e que permitiu reduzir a dimensão e aumentar a capacidade daqueles equipamentos e dar início à segunda geração de computadores. Em 1958, a Texas Instruments cria o circuito integrado que tornou possível outro salto na potência dos computadores. Em 1968, Robert Maurer inventa a fibra óptica que nos anos seguintes iria revolucionar as comunicações ao permitir velocidades de transmissão multíssimo superiores às ató então existentes. A disquete surge em 1970 pela mão da IBM, a Intel desenvolve o microprocessador em 1971 e o primeiro computador pessoal é lançado no mercado pela Apple em 1976. O CD-ROM é inventado pela Philips e pela Sony em 1985 e a multimédia e a realidade virtual dão os primeiros passos antes do final da década de noventa.

A evolução tecnológica que acabámos de relatar foi acompanhada por profundas mutações nas empresas e na sociedade. Após a fase inicial de utilização daquela embrionária mas já extraordinariamente potente capacidade de cálculo, para fins militares na determinação de trajectórias balísticas, o computador entrou nas aplicações civis. Em 1951, serviu pela primeira vez para um fim da sociedade civil ao ser utilizado para o tratamento da informação estatística dos censos da população dos EUA.

Pouco tempo levou para que as empresas lhe dessem novas utilizações. Começou primeiro pela informação administrativa: facturação, processamento de vencimentos, controlo de depósitos bancários, emissão de licenças de rádio, emissão de formulários para pagamento de impostos e outras aplicações decorrentes da sua
elevada velocidade a fazer ordenações, cálculos numéricos simples ou complexos, selecções de acordo com regras previamente 'programadas' e, ainda, a capacidade de controlar as respectivas impressões em papel preparado para o efeito.

Nos dias de hoje, já está em condições de se abalarçar a aplicações mais sofisticadas. Surgem sistemas integrados de gestão com enfoques sectoriais diversos. Assim, começa a invadir a gestão de recursos humanos, o processamento de informação contabilística, os sistemas de reserva de passagens aéreas, a gestão bancária nas suas múltiplas facetas, os sistemas de encomenda electrónica e muitos outros procedimentos administrativos das empresas e do estado.

Na década seguinte toma conta dos escritórios pela via dos sistemas de escritório electrónico e entram as instalações fabris para realizar as complexas tarefas de gestão de produção. Nesta altura, os computadores ainda eram máquinas grandes, exigentes na climatização do espaço, na alimentação eléctrica e que não dispensavam em muitas circunstâncias o chão falso. Mas, em breve surge o microcomputor de utilização pessoal capaz de efectuar muitas das tarefas do seu parente mais velho, às ordens do seu mestre ou dono sem interferências de outros, sejam eles utilizadores ou o pessoal dos departamentos de informática.

Acontece então uma explosão de crescimento. O computador pessoal infiltra-se no lar através dos jogos para crianças e adultos e rapidamente converte-se num precioso auxiliar na preparação dos textos escritos, na contabilidade familiar e nas pequenas bases de dados de uso pessoal. Nas empresas penetra em novos domínios de apoio à decisão, no desenho automático de projectos, na publicação electrónica e aperfeiçoa as aplicações anteriores agora com o recurso a potentes sistemas de gestão de bases de dados, a linguagens de desenvolvimento de aplicações com geração de código e a programação orientada por objectos. Desenvolvem-se aplicações que interferem com a vida dos cidadãos no seu dia a dia. São as caixas de pagamento automático que permitem aceder às contas bancárias para levantamentos de dinheiro, pagamentos de facturas e outros serviços, os terminais nos pontos de venda para liquidação das despesas nos estabelecimentos comerciais, os leitores ópticos associados a potentes sistemas informáticos que mudaram todo o sector da distribuição, contribuindo para alterar os hábitos de consumo e de lazer.

Poderíamos ser levados a pensar que esta profunda evolução estaria a atingir a sua fase de maturação e que no futuro teríamos tempo e vagar para nos adaptar às alterações entretanto ocorridas. Nada poderá ser mais errado! A velocidade de cálculo dos computadores tem estado a decuplicar cada três anos e o seu custo global a decrescer em média 20% ano. O que custava 100 000 contos em 1954 corresponde em 1995 a 2 contos. Esta tendência em vez de se reduzir tem estado a acelerar nos últimos anos. Está a ocorrer a introdução de enormes capacidades de processamento nos aparelhos do dia-a-dia. Aproximamo-nos a grande velocidade da época da 'lógica de custo nulo'. Quer isto dizer que o custo de realização das operações lógicas está a ficar cada vez mais próximo de zero.

Em paralelo, as comunicações têm igualmente evoluído a um ritmo vertiginoso. Quando em 1968 foi inventado o cabo de fibra ótica foi possível
transmitir um Gigabits de informação por segundo a alguns quilómetros de distância. Isto corresponde a um bilhão (mil milhões) de componentes elementares de informação em cada segundo. Perceberemos a dimensão destes valores, se tivermos presente que o padrão dos telefones convencionais para a transmissão de voz é de 64 Kbps, isto é, sessenta e quatro mil componentes elementares de informação por segundo e que a enciclopédia Britânica com os seus trinta volumes densamente recheados corresponde a 1,5 Gigabits de informação.

A evolução dos cabos de fibra óptica tem sido também espectacular. Em cada quatro anos, uma variável que representa o produto da velocidade de transmissão pela distância a que se consegue transmitir sem amplificação de sinal tem decuplicado. Estamos actualmente na quinta geração de cabos de fibra óptica. É agora possível transmitir cinco Gigabits de informação por segundo a dez quilómetros de distância, sem ampliação de sinal. Isto corresponde a enviar três enciclopédias Britânicas em cada segundo a uma distância igual a um quarto de um meridiano da terra, sem necessidade de ampliar o sinal.

Nada faz supor que o ritmo de crescimento da velocidade de transmissão de informação vá reduzir-se no futuro. A velocidade de transmissão depende da frequência do tipo de luz utilizada e da capacidade de controlar e identificar os sinais de luz transmitidos. Presentemente utiliza-se luz Laser, cuja frequência é 5x10^{14} Hertz. Porém, o espectro electromagnético é muito extenso e o futuro pode reservar-nos outros saltos qualitativos importantes, com escalas de velocidades de transmissão muito superiores às actualmente existentes.

O casamento entre as técnicas de informática e das comunicações já ocorreu há alguns anos. Ao fim e ao cabo, os computadores e, consequentemente, as técnicas de informática lidam com ‘bits’ de informação, isto é, zeros e uns. Desde que se avançou nas telecomunicações para a digitalização das redes que a informação que percorre as redes é da mesma natureza. Não há portanto distinção entre os elementos básicos de informação que fluem nos computadores e nas redes de telecomunicações. A grande área composta pela informática e pelas telecomunicações designa-se por telemática.

A informação quer esteja na forma de texto, gráficos, imagens, som ou vídeo reduz-se sempre às suas componentes elementares: os ‘bits’, ou seja, a zeros e uns. A tecnologia evoluiu até ao ponto de tornar possível aplicações que integram estes variados tipos de informação. A esse domínio chama-se a multimédia.

As aplicações da multimédia e da telemática são imensas. A fase de investigação aplicada e de experimentação nas universidades e nos laboratórios de investigação já provou o seu enorme potencial. O mercado está a receber continuamente novas aplicações nas áreas da formação, emprego, entretenimento e negócios. Num mundo em que a informação ocupa um lugar cada vez maior, somos todos abrangidos pelos impactos que estas técnicas irão provocar no funcionamento da sociedade, nomeadamente novas formas de organização das empresas, outras formas de aprender e de aproveitar os tempos de lazer, novas formas de contribuir para a sociedade com o trabalho individual, acesso a uma grande variedade de serviços de informação e de telemática que alteram a forma como se adquire conhecimento e se
interactua com o meio envolvente. A ‘Sociedade da Informação’ chegou a nós e veio para ficar.

3. Um Desafio para a Europa

A Europa já iniciou o seu caminho para a sociedade da informação. O sinal de partida foi dado pelo relatório da Comissão Europeia, sob os auspícios do seu Presidente Jacques Delors, através do Livro Branco sobre “Crescimento, Competitividade, Emprego - Os Desafios e as Pistas para Entrar no Sécu {XXI}”. Este relatório, publicado em Dezembro de 1993 na sua versão original, dedica uma secção à sociedade da informação. Afirma-se ali que ‘A Europa dispõe do know how e da experiência indispensáveis para a implementação de um espaço comum da informação. Contudo, importa ainda mobilizar estas potencialidades num esforço comum e criar um enquadramento político que permita pôr em prática, o mais brevemente possível, as acções necessárias’. De facto, a Europa está longe de liderar o processo de transformação da sociedade pós-industrial na Sociedade da Informação. Uma proporção significativa da inovação e da liderança do mercado tem estado no outro lado do Atlântico em Silicon Valley e em outras zonas dos EUA. O Japão e os tigres Asiáticos têm sabido apropriar-se de alguma dessa tecnologia, nomeadamente ao nível do fabrico de memórias, processadores e outros ‘chips’ e concorrido no mercado mundial, tirando partido das indiscutíveis qualidades da sua mão-de-obra.

Perante as potencialidades do sector da informação para a criação de emprego sustentável, para a transformação das organizações com aumento da sua produtividade, para a melhoria da qualidade de vida das populações, podendo ainda ser um factor de coesão económica e social, é evidente a necessidade de não se perder tempo na adaptação à sociedade da informação que está emergir.

Consciente da urgência do assunto, Delors propôs a criação de uma ‘task force’ a nível topo de decisão para reflectir sobre as infraestruturas europeias da informação, com a missão de estabelecer as prioridades e definir um programa de acções e o respectivo calendário. Esta comissão funcionaria sob mandato do Conselho Europeu e ficaria responsável pela apresentação no prazo de três meses, após concertação com as diversas partes envolvidas, de um relatório ao Conselho Europeu. Essa comissão seria composta de um membro da Comissão Europeia, de alguns representantes dos Estados-Membros, de representantes do Parlamento Europeu e de representantes de alto nível da indústria, operadores de telecomunicações, instituições financeiras e utilizadores.


À frente veremos alguns aspectos dessa estratégia. Importa-nos agora relatar a sequência dos acontecimentos a nível europeu desencadeados pelo reconhecimento do
relatório Delors da importância estratégica da sociedade da informação. Na reunião do Conselho Europeu de Corfu, realizada em Junho de 1994, os temas levantados foram considerados de tal importância que o Conselho propôs-se criar um instrumento permanente de coordenação a nível ministerial e solicitar à Comissão o desenvolvimento de um Plano de Acção para ajudar à realização da sociedade da informação na Europa.

A Comissão publica em Julho de 1994 “A Via Europeia para a Sociedade da Informação - Plano de Acção” que constitui uma comunicação da Comissão ao Conselho e ao Parlamento Europeu, ao Comité Económico e Social e ao Comité das Regiões. Este documento constitui um elemento chave da estratégia da União Europeia para alcançar a sociedade da informação, na sequência do qual o Parlamento Europeu aprova a sua importante resolução nº 73/94 sobre a “Sociedade da Informação”. Em menos de um ano, a sociedade da informação tinha-se imposto aos líderes da União Europeia e dispunha de um ‘plano de Acção’ para a sua concretização.

Já em Fevereiro de 1995 realiza-se a Conferência Ministerial de Alto Nível dos países G7 sobre a “Sociedade da Informação Global”. Com esta etapa, a sociedade da informação impôs-se à escala global. Não querer ver esse facto ou dar-lhe importância menor é pretender actuar como a avestruz que perante as dificuldades esconde a cabeça debaixo da areia.

Infelizmente, em Portugal pouco se tem debatido os problemas e as potencialidades da sociedade da informação. Atendendo ao seu carácter universal e à rapidez com que se expande, a distração nestas matérias pode custar caro ao desenvolvimento económico-social do país. Já se perdeu em Portugal, na altura certa, a revolução industrial. A história não pode voltar a repetir-se com a revolução da sociedade da informação.

O conceito de ‘Sociedade da Informação’ vai buscar as suas raízes às teorizações da ‘Sociedade Industrial’ que os sociólogos do final do século passado desenvolveram, contrapondo à sociedade pré-industrial ou à sociedade tradicional.

Na década de setenta, começou a constatar-se que a teoria da sociedade industrial já estava desajustada à realidade em face das profundas alterações verificadas na estrutura e na organização das economias mais evoluídas. Alguns autores começam a referir-se à sociedade pós-industrial, manifestando ainda alguma precaução quanto à caracterização da sociedade que estava a emergir. Um desses autores é Daniel Bell no seu livro “The coming of Post Industrial Society”, publicado em 1973, procura prevêr algumas das mutações que a evolução das sociedades mais modernas já indiciavam e simultaneamente lançar um amplo debate sobre os caminhos de mudança da sociedade e reflectir sobre as direcções que se deveriam procurar apontar.

Uma das teses principais de Bell é que a transição da sociedade industrial para a sociedade pós-industrial será uma mudança mais radical do que tinha sido a passagem da sociedade pré-industrial para a sociedade industrial. Em particular, prevê
que na sociedade pós-industrial não será nem a energia nem a força muscular que
liderarão a evolução, mas sim o domínio da informação. Nesta visão, os sistemas da
sociedade, humanos ou organizacionais, são basicamente conceptualizados como
‘sistemas de informação’.

Enquanto que na sociedade industrial a classe mais numerosa é a dos
trabalhadores cuja actividade está ligada à produção industrial em massa, segundo o
modelo de Taylor, na sociedade pós-industrial prevalece o ‘conhecimento’, surgindo
de forma predominante o emprego associado às atividades de organização, educação,
serviços e informação para negócios e ainda em instituições de natureza social, de
cuidados de saúde e de actividades de lazer.

Um outro estudo⁵ de Marc Porat analisa a evolução da mão-de-obra nos EUA
desde meio do século passado até à data da publicação (em 1977) e constata que a
percentagem da população activa com actividade no sector da informação cresceu
constantemente, passando de cerca de 5% em 1850 para perto de 50% no final da
década de oitenta. Movimento oposto é verificado com o emprego na agricultura que
evolui de 45% em meados do séc.XIX para menos de 3% em 1980 e a indústria que
no mesmo período cai de 40% para cerca de 20%. Só a actividade de prestação de
serviços pessoais se manteve praticamente inalterada com uma quota de 20% do
emprego total.

A tendência observada por Porat não parou de se acentuar. Actualmente, a
percentagem de população activa no sector da informação nos EUA já ultrapassa os
60% e a Comissão Europeia estima que a Europa no ano 2000 atinja 65% de
população activa neste sector.

Os dois trabalhos referidos anteriormente apontam para o despertar da
sociedade da informação. Na década de oitenta muitos outros trabalhos foram
publicados que evidenciavam a profunda mutação que a sociedade está a sofrer em
consequência do desenvolvimento das tecnologias da informação e da comunicação.

Entre estes contam-se os livros de Masuda⁶ “The Information Society as Post-
Industrial Society”, Alvin Toffler⁷ “The Third Wave”, Nora e Mine⁸ “The
Computerisation of Society” e relatórios oficiais de diversos governos, nomeadamente “Making a Business of Information”, “The Information Economy:
Definition and Measurement” e “Sunrise Europe”, respectivamente dos governos
Inglês, Americano e da Comissão Europeia.

Estes trabalhos apesar da sua diversidade, resultado de focagens e ênfases
distintas, partilham alguns pontos comuns, nomeadamente o reconhecimento que as
comunicações desempenham um papel central e de importância económica crescente
para as famílias, para as empresas e para os estados.

Nas primeiras visões da sociedade da informação prevalecia a hipótese
implícita de que os consumidores procurariam naturalmente mais informação e que as
novas soluções electónicas para os meios de comunicação social eram inerentemente
democráticas e descentralizadoras. Porém, a realidade tem demonstrado que nem
sempre os consumidores seguem a oferta de novos serviços de informação electrónica, como se verificou em relação ao videotexto, com exceção do Minitel em França e que alguns dos desenvolvimentos tanto podiam ter consequências centralizadoras como descentralizadoras e implicações democráticas ou anti-democráticas.

O pressuposto de que a infraestrutura de comunicações seria um monopólio natural cabendo ao estado velar pelo seu desenvolvimento de forma a assegurar a universalidade de acesso, começou a ser posto em causa devido à intensa evolução tecnológica que aumenta o risco do planeamento de longo prazo e transfere a condução do processo de crescimento para as forças de mercado. Esta conclusão transvisa o pensamento dos autores pioneiros na sociedade da informação como Daniel Bell e outros que desenhavam para o estado um papel muito mais interveniente na construção da nova sociedade.

A classe política e os líderes de opinião foram progressivamente reconhecendo que a sociedade da informação é essencialmente uma sociedade de mercado. As instituições públicas cabe fundamentalmente um papel regulamentador para evitar exageros e injustiças que possam decorrer do funcionamento das forças de mercado. A emergência da sociedade da informação tem tanto de imprevisível como é rica de oportunidades para as famílias, para as empresas e para as nações que saibam apetrechar-se de forma a não deixar escapar os seus benefícios.

4. A Estratégia Europeia

O relatório do Comissário europeu Bangemann desenvolve um conjunto de recomendações para a construção da sociedade da informação na Europa. Um dos principais vectores subjacentes a este relatório é o de que será o investimento privado a força motriz da construção da sociedade da informação. É o mercado que conduz o processo e decide através das forças da concorrência quem ganha e quem perde. Aos governos está reservado o papel de proteger o funcionamento dos mecanismos de mercado e apoiar acções que promovam o desenvolvimento das tecnologias, serviços e aplicações que, maximizem o contributo da sociedade da informação para os objectivos mais gerais do desenvolvimento económico e social.

A informação tem um impacto transversal sobre todos os sectores da economia. O potencial de criação de novas actividades e de emprego é muito diversificado. Refere-se a título de exemplo os mercados do sector dos negócios, das pequenas e médias empresas e do consumo e entretenimento. Em relação ao primeiro, a exploração das tecnologias de informação para melhorar a eficiência dos sistemas de gestão e de produção tem demonstrado o seu enorme potencial. Novos serviços como a teleconferência, o telecomércio e a transferência electrónica de dados (EDI) oferecem tantas vantagens em termos de eficiência e de tempo que a sua generalização futura irá criar novas oportunidades de emprego. A ligação em rede das pequenas e médias empresas para receberem e oferecerem informação sobre oportunidades de mercado e de produção contribuirá para o reforço da sua competitividade, fortalecendo consequentemente esta componente do tecido produtivo tão importante na criação de emprego. Nos mercados de consumo e entretenimento prevê-se uma proliferação de serviços com o acesso das habitações às velocidades de transmissão permitidas pela
fibra óptica. Dado que a instalação da infraestrutura de telecomunicações em fibra óptica até ao consumidor final tem um custo fixo elevado, é natural que a sua amortização envolva múltiplos serviços desde a telefonia vocal até ao vídeo a pedido, passando pela televisão interactiva, pelas telecompras e os novos serviços de telemedia, telebanco, telesaúde e de telessegurança para o lar.

Um outro vector subjacente ao relatório de Bangemann é o da liberalização do sector das telecomunicações, da televisão e das indústrias afins, de forma a estimular o desenvolvimento rápido das novas infraestruturas e serviços necessários à construção da sociedade da informação. A questão central que se coloca é o da definição de um quadro regulamentar claro que permita o livre jogo da concorrência. Dessa forma, será possível acabar com os monopólios. Todos os operadores públicos licenciados terão a sua quota parte de responsabilidade na prestação de serviços públicos, nomeadamente na obrigação de serviço universal da telefonia vocal e no acesso às novas redes e serviços da sociedade da informação.

Para que a liberalização possa ser eficaz é necessário promover a normalização de componentes técnicos, a interconexão das redes e a interoperabilidade dos serviços e aplicações na União Europeia. Só desta forma é que se eliminarão as descontinuidades das redes e se possibilita que serviços e aplicações baseados nessas redes interfuncionem. O desafio consiste em estabelecer interconexões para a rede fixa de telecomunicações e as novas redes celulares e por satélite, assim como entre os serviços básicos e a rede digital de integração de serviços (RDIS).

O mercado alargado das novas redes e serviços exige uma adequada protecção jurídica das questões de privacidade individual, direitos de propriedade intelectual, propriedade dos media e de acesso a procedimentos de cifragem. Estes últimos, por exemplo, são um mecanismo essencial ao desenvolvimento dos serviços pagos. Através da cifragem ficará garantido que só receberá o serviço quem pagar. O mercado ficará beneficiado se o enquadramento jurídico conduzir, pela harmonização internacional, a um sistema normalizado de cifragem. A protecção dos direitos de autor é outra condição essencial para a promoção de serviços de valor acrescentado. Sem uma adequada protecção dos direitos de propriedade intelectual desaparecerão muitos dos estímulos para a criatividade e a inovação no desenvolvimento dos novos serviços da sociedade da informação.

Para concluir esta breve análise de estratégia europeia para a sociedade da informação, gostaríamos de mencionar as dez aplicações que o relatório Bangemann identifica e propõe como função de demonstração para o desenvolvimento da estrutura da sociedade da informação, cuja implantação na Europa urge promover para evitar que a liderança da nova sociedade se centre noutras zonas do globo, com prejuízo da competitividade das empresas europeias e da qualidade de vida dos cidadãos:

4.1. Teletrabalho

Promover o teletrabalho quer em casa quer em centros locais destinados para o efeito. Deste modo, as deslocações de trabalho serão reduzidas e as empresas e a
administração pública beneficiarão com ganhos de produtividade. Para este efeito, é necessário que os operadores de telecomunicações disponibilizem as redes necessárias a preços competitivos. A meta a atingir é transformar 2% dos trabalhadores dos serviços em trabalhadores à distância em 1996 e 10 milhões de postos de trabalho à distância até ao ano 2000.

4.2. Ensino à Distância

Promover a criação de centros de ensino à distância que ofereçam meios para formação e ensino destinados às empresas e à administração. Os principais beneficiários serão as PME e as administrações públicas, através das reduções de custos e da melhor utilização dos recursos escassos para formação e ensino. Pretende-se atingir a meta de projectos piloto em pelo menos 5 países em 1995 e de utilização de ensino à distância por 10% das PME e das administrações públicas em 1996.

4.3. Uma Rede para Universidades e Centros de Investigação

Pretende-se ligar em rede os investigadores europeus. Será desenvolvida uma rede transeuropeia de banda larga com capacidade para transporte de serviços multimédia interactivos entre as universidades e centros de investigação em toda a Europa, com acesso aberto às suas bibliotecas. A produtividade dos programas de investigação será aumentada através da criação de equipas mais amplas que impulsionarão o estabelecimento de sinergias entre instituições com interesses comuns. A meta a atingir é de 30% das universidades e centros de investigação europeus ligados através de redes de comunicações avançadas em 1997 e a sua extensão a outros países europeus logo que isso seja tecnologicamente possível.

4.4. Serviços Telemáticos para as PME

Para relançar o principal motor de crescimento e de emprego na Europa, que é constituído precisamente pelas PME, irá promover-se a mais ampla utilização dos serviços telemáticos, nomeadamente o correio electrónico, a transferência de ficheiros, o EDI, a videoconferência, o ensino à distância, etc., pelas PME europeias, com ligações às autoridades públicas, associações comerciais, clientes e fornecedores. Desta forma, as PME poderão concorrer numa base mais equitativa com as empresas de maior dimensão. A meta a atingir é assegurar o acesso aos serviços telemáticos transeuropeus para as PME até ao final de 1995 e a utilização das redes telemáticas por 40% das PME com mais de 50 empregados até 1996. Será igualmente dada prioridade à ligação das PME às redes administrativas.

4.5. Gestão de Tráfego Rodoviário

Pretende-se implementar estradas electrónicas para uma melhor qualidade de vida. Irão ser criadas soluções telemáticas à escala europeia para os sistemas avançados de gestão de tráfego rodoviário e outros serviços de transporte, nomeadamente a informação aos condutores, orientação rodoviária, gestão de frota, informação sobre portagens, etc.. Os condutores, as comunidades locais, a indústria e o meio ambiente beneficiarão da redução de tráfego, da maior segurança rodoviária e
da maior economia de energia. Os primeiros beneficiarão ainda de menores tempos de deslocação. A meta a atingir é a implantação de sistemas telemáticos para a gestão de tráfego em 10 áreas metropolitanas e em 2 000 km de estradas até 1996 e de 30 áreas metropolitanas e a rede transeuropeia de autoestradas até ao ano 2 000.

4.6. Controlo do Tráfego Aéreo

Neste caso o objectivo é uma via aérea electrónica para a Europa. Irá ser criado um sistema europeu de comunicações para o tráfego aéreo que ofereço conexões terra-terra entre todos os centros europeus de controlo de tráfego aéreo e conexões ar-terra entre aeronaves e centros de controlo de tráfego aéreo em toda a União Europeia. O objectivo é dispôr-se de um sistema transeuropeu unificado de controlo de tráfego aéreo. Os milhões de passageiros e a indústria europeia de transporte aéreo beneficiarão de um sistema mais seguro, com menor congestionamento e a consequente redução de tempo de viagem e do consumo de energia. Haverá ainda benefícios indirectos nos custos ambientais. A meta a atingir é um sistema transeuropeu operacional antes do ano 2 000.

4.7. Redes para os Cuidados de Saúde

Pretende-se obter sistemas mais económicos e eficazes de cuidados de saúde. Será criada uma ‘rede de redes’ para comunicações directas, com base em normas comuns, entre os médicos de clínica geral, hospitais e centros sociais à escala europeia. Os doentes beneficiarão de uma melhoria dos cuidados de saúde, nomeadamente a nível de diagnóstico através do acesso a especialistas europeus, reserva directa de análises e serviços hospitalares e identificação de compatibilidade de órgãos para transplante alargada a toda a Europa. A meta a atingir é a ligação à escala europeia dos principais prestadores de cuidados de saúde. Num primeiro fase será criada uma rede nos Estados-membros ligando clínicos gerais, especialistas e hospitais a nível regional e nacional.

4.8. Informatização dos Concurso Públicos

Pretende-se obter uma administração mais eficiente e menos dispendiosa. Serão introduzidos procedimentos electrónicos para os contratos públicos entre as administrações públicas e fornecedores na Europa, ao que se seguirá a criação de uma rede electrónica europeia para concursos públicos. As administrações públicas beneficiarão de um ambiente de maior concorrência entre fornecedores, as PME beneficiarão da participação em contratos públicos transeuropeus e esta nova metodologia constituirá um poderoso meio de difusão e de criação de massa crítica para o mercado dos serviços telemáticos na Europa. A meta a atingir é uma massa crítica correspondente a 10% das entidades adjudicantes que utilizarão procedimentos electrónicos para as suas aquisições, num período de 2 a 3 anos.

4.9. Rede Transeuropeia de Administrações Públicas

Esta rede visa a interconexão das redes das administrações públicas da Europa, para proporcionar o intercâmbio de informações de forma mais eficaz. Numa fase
posterior a rede será alargada à ligação entre as administrações públicas e os cidadãos europeus. O processo de unificação para o mercado único Europeu sairá reforçado e as administrações beneficiarão de redução de custos e de maior simplicidade em muitos procedimentos administrativos. A meta a atingir é a implantação da interconexão de redes que permitam o intercâmbio de informação fiscal, aduaneira, estatística, de segurança social e de cuidados de saúde até final de 1996.

4.10. Auto-estradas da Informação nas Cidades

Pretende-se introduzir no lar a sociedade da informação. Irão ser instaladas redes que permitirão o acesso a partir das habitações a serviços directos de multimedia e de entretenimento numa base local, regional, nacional e internacional. Os consumidores terão assim oportunidade de beneficiar de novos serviços multimedia, poderão fazer as suas opções de entretenimento num domínio mais vasto, disponar de serviços orientados para as transacções como o televendas e as telecompras, ganharão acesso a novos serviços de informação e poderão ainda beneficiar das facilidades de teletrabalho e de ensino à distância. A meta a atingir é pôr em funcionamento essas redes em 5 cidades europeias com um máximo de 40 000 lares por cidade até 1997.

Este conjunto de dez aplicações das tecnologias da informação irá definitivamente contribuir para o reforço da União Europeia e do seu espírito de liderança à escala global assim como para consolidação da sociedade da informação que se encontra actualmente a despontar.

5. Telecomunicações e Coesão Europeia

A sociedade da informação que está a emergir necessita como infraestrutura de suporte de uma rede de telecomunicações avançadas. As aplicações com maior impacto na sociedade e que apresentam maior poder mediático requerem para a sua implantação aquilo a que se poderão chamar as auto-estradas da informação. Do teletrabalho à telemedicina, passando pelos novos serviços de acesso à informação que a INTERNET já oferece hoje e reforçará no futuro, pelo ensino à distância, pelas telecompras e pelos serviços de video interactivo, as comunicações avançadas estão no seu cerne e constituem uma condição insubstituível para a sua difusão.

A evolução tecnológica dos cabos de fibra óptica assegura elevadas velocidades de transmissão de dados da ordem de diversos gigabits por segundo o que corresponde a bilhões de unidades elementares de informação em cada segundo. Estas velocidades são suficientes para suportar as aplicações mencionadas. Assim, não se trata de um problema de inovação tecnológica aquilo que constitui o impedimento à imediata generalização e concretização das promessas da sociedade da informação.

O busílis da questão reside no elevado investimento necessário à substituição da infraestrutura de telecomunicações existente. No que se refere às linhas de maior
dité que ligam os centros principais, parte desse investimento já foi efectuado pelos operadores de telecomunicações nos últimos anos. Porém, ao nível da ligação do assinante final há um atraso significativo, resultante do montante global de investimento envolvido.


A este respeito o grupo exprime com determinação a necessidade de romper com o passado, de acabar com os monopólios e de viabilizar o funcionamento do mercado. No relatório, é dito abertamente: “O grupo está convinto de que o progresso tecnológico e a evolução do mercado exigirão que a Europa rompa com políticas baseadas em princípios que pertencem a um período anterior ao advento da revolução da informação” e mais à frente explicita “A questão essencial para o surgimento de novos mercados é a necessidade de um novo ambiente regulamentar que permita o livre jogo da concorrência. Trata-se de um pré-requisito para mobilizar o capital privado necessário à inovação, ao crescimento e ao desenvolvimento”.

Em linhas gerais, o programa proposto para a sociedade da informação assenta nos dois pilares seguintes:

- Liberalização das telecomunicações, rádio, televisão e indústrias afins para estimular o desenvolvimento rápido de novas infraestruturas e serviços;
- Apoio a acções que promovam o desenvolvimento das tecnologias adequadas, serviços, aplicações e estruturas de gestão que maximizem a contribuição da sociedade da informação, subordinada a objectivos sociais e económicos de maior amplitude e relevância.

Desde sempre que a Comunidade tem tido uma preocupação com as disparidades regionais. O Tratado de Roma, logo no seu Artigo segundo requer que a CEE promova o desenvolvimento harmonioso e uma expansão contínua e equilibrada da actividade económica em toda a Comunidade, acompanhado por um aumento crescente das condições de vida das populações.

Em todos os momentos críticos do crescimento da Comunidade, a componente de coesão, que tem a ver com a redução das disparidades regionais, tem sempre saído reforçada com novas políticas estruturais que visam facilitar a adaptação das regiões mais débeis a uma economia cada vez mais integrada. No primeiro alargamento em 1974, a entrada da Inglaterra colocou o problema das antigas regiões industriais atingidas pela crise da mutação da sociedade industrial e que tiveram necessidade de receber o apoio dos fundos de coesão. O alargamento à Grécia, Espanha e Portugal que se desenrolou na primeira metade da década de oitenta trouxe novas preocupações com as disparidades regionais, de que resultou a necessidade de aprofundar as medidas de coesão com o reforço dos Fundos Estruturais. A assinatura em 1989 do Acto Único Europeu a que se seguiu o Tratado de Maastricht em 1993 foram ambas
acompanhadas por reformas dos Fundos Estruturais com reforço das verbas destinadas à coesão europeia. O Tratado de Maastricht, por exemplo, estabeleceu a criação do Fundo de Coesão para apoiar projetos de melhoria ambiental e o desenvolvimento das redes transeuropeias para os países mais pobres da Comunidade.

É forçoso reconhecer que existe alguma ambigüidade na posição da União Europeia entre os objectivos de coesão e do acréscimo da competitividade da Europa através da integração europeia. Em certa medida estes objectivos são conflitantes. Alguns sectores económicos, como o da agricultura em Portugal, terão já reconhecido que a integração europeia significa um enorme acréscimo de concorrência que não contribui imediatamente para a redução das disparidades regionais.

Para alguns autores, a ambigüidade é eliminada encarando as medidas de coesão com um objectivo secundário concebido para reduzir os efeitos regionais negativos do objectivo principal que consiste na integração europeia através da economia de mercado.

Na área das telecomunicações os primeiros passos para uma política europeia consistente foram dados no início da década de oitenta. Em 1987 é publicado o relatório comunitário “Desenvolvimento do Mercado Comum para Serviços de Telecomunicações e Equipamentos”. Nesta altura foi reconhecida a relevância simultânea da integração europeia na área das telecomunicações e da necessidade de reduzir as disparidades regionais nesse mesmo domínio.

Daí resultaram importantes derrogações da criação do mercado único europeu na área das telecomunicações para alguns dos países europeus com maior atraso em relação à média europeia e programas de financiamento para reduzir essas disparidades regionais, nomeadamente o STAR (Special Telecommunications Actions for Regions) e o TELEMATIQUE, para além de contributos vindos de outros programas como o RACE ou o ORA.

Nos relatórios de política europeia mais recentes houve um enfraquecimento da ênfase na coesão europeia no que se refere às telecomunicações e à criação da sociedade da informação. Isso talvez seja devido à hipótese implícita de que o desenvolvimento da sociedade da informação tem um efeito intrinsecamente descentralizador e que, portanto, a coesão europeia sairá reforçada com o emergir da sociedade da informação.

Ao longo do relatório Bangemann há várias afirmações que apontam nesse sentido. Por exemplo, refere-se que “a sociedade da informação pode melhorar a qualidade de vida dos cidadãos europeus... e reforçar a coesão” e que a sociedade da informação dá às regiões da Europa “novas oportunidades para exprimir a sua identidade e as suas tradições culturais e, para as que se situam na periferia geográfica da União, a atenuação da distância e do isolamento”. É ainda mencionado que os “satélites têm a vantagem de levarem as comunicações avançadas a regiões remotas e rurais”, que “a ligação em rede servirá... para diminuir o isolamento das PME situadas nas regiões menos favorecidas, ajudando-as a melhorar os seus produtos e a descobrir
mercados mais vastos’ e que pela via do teletrabalho ‘para aqueles que habitam em locais distantes, a redução das distâncias ajudará à coesão’.

Porém, o próprio relatório Bangemann reconhece que no desenvolvimento da sociedade da informação ‘o principal risco reside na criação de uma sociedade com duas camadas, a dos que têm e a dos que não têm, na qual só uma parte da população tem acesso às novas tecnologias, se habitua a utilizá-las e desfruta plenamente dos seus benefícios’.

A hipótese de que a sociedade da informação reforça a coesão não está de forma alguma provada, particularmente enquanto subsistirem disparidades entre a capacidade das regiões menos favorecidas e das regiões mais desenvolvidas para participarem na sociedade da informação e permanecerem barreiras relativas à disponibilidade de serviços e à capacidade dos adquirir entre os países da União.

As questões a que importava obter resposta para esclarecer se é previsível que, na ausência de medidas específicas de coesão, as disparidades regionais se vão acentuar, são as seguintes:

- Existe actualmente uma diferença ou atraso entre os países menos favorecidos da União Europeia e os restantes para participar na sociedade da informação?
- Está esse atraso a crescer?
- É provável que esse atraso continue a crescer no futuro?
- Para além de um eventual atraso na participação na sociedade da informação, haverá outras questões que limitem o uso das novas redes e serviços de uma forma eficaz?
- Quais são as barreiras à utilização dos novos serviços?
- Contribuem essas barreiras para aumentar as disparidades regionais?
- Em que medida estarão presentes as condições económicas e sociais necessárias para ultrapassar essas barreiras?

A sociedade da informação não se implantará de forma homogênea na Europa, contribuindo para dissipar os riscos de uma sociedade a duas velocidades, sem que os atrasos e as barreiras existentes sejam eliminados ou fortemente atenuados. A identificação destes é uma tarefa imprescindível para se saber qual vai ser o futuro da sociedade da informação na Europa.

A dinâmica da sociedade da informação envolve dois círculos virtuosos. Um resulta da percepção pelos utilizadores dos benefícios associados à própria sociedade da informação. À medida que a percepção dos benefícios aumenta, a utilização intensifica-se, a qual por sua vez vai produzir maiores benefícios de que resulta uma intensificação da percepção dos próprios utilizadores, entrando-se deste modo no círculo virtuoso.

Este círculo virtuoso pode ser consideravelmente reforçado se a região ou país desempenharem um papel pro-activo dentro da própria sociedade da informação. Ou seja, não bastará uma posição de consumo passivo dos frutos da sociedade da informação. É necessária uma atitude empenhada na provisão de serviços avançados.
produção de equipamentos, desenvolvimento de software, etc., que conduzirá naturalmente a uma utilização mais eficaz pela região, em virtude da acumulação de mão-de-obra mais qualificada, da geração de actividades de suporte, da criação de um mercado local e do desenvolvimento da aplicações da sociedade da informação ajustadas às suas próprias necessidades.

O segundo círculo virtuoso está associado ao acesso aos serviços da sociedade da informação. À medida que a utilização aumenta a oferta de serviços tende a crescer o que reforça as opções de acesso e conduz a maior utilização e, portanto, a custos mais baixos, que por sua vez vão intensificar a utilização desses mesmos serviços.

Para além destes dois círculos virtuosos que importa pôr em movimento para intensificar os benefícios que um país ou região pode colher da sociedade da informação, existem outros condicionalismos que é necessário ter presente para uma utilização eficaz.

Em primeiro lugar, para uma utilização efectiva dos serviços avançados é preciso haver uma focagem nas necessidades reais, uma força de trabalho educada na utilização dos serviços e capacidade organizacional para intruduzir e assimilar no tecido produtivo as novas tecnologias. Por outro lado, existe um número de outros aspectos mais gerais que funcionam como pré-requisitos. Entre estes estão o nível de educação, o número de computadores disponíveis e o grau de literacia informática, assim como a disponibilidade de capital para os investimentos na infraestrutura de comunicações essencial à implantação da sociedade da informação.

Não cabe neste artigo uma análise detalhada das estatísticas que permitam aferir o posicionamento de Portugal em relação às variáveis mencionadas, de onde se possa estimar a capacidade para participar efectivamente na sociedade da informação. Apesar disso, justifica-se que observemos alguns dados comparativos a nível europeu para percebermos se a divergência em relação aos países mais desenvolvidos do centro da Europa, nos cria o risco de exclusão na corrida para a sociedade da informação. A identificação das barreiras e bloqueamentos será certamente útil para a definição de uma estratégia nacional de superação de atrasos que nos coloque na senda do progresso pela via da sociedade da informação emergente, em paralelo com os nossos parceiros na União Europeia.

O indicador estatístico que nos vai servir de ponto de partida é o número de linhas telefónicas por 100 habitantes representado na Fig.1.
A posição de Portugal neste indicador é de último lugar entre os países da União Europeia. Para além da utilização da rede de telecomunicações, que em Portugal é a mais baixa da Europa, importa também saber a qualidade da rede básica de telecomunicações. Na Fig. 2 apresenta-se informação relativa ao número de avarias e sobre a celeridade da sua reparação. A Fig. 3 posiciona-nos, no contexto Europeu, quanto à frequência de avarias. A situação é uma vez mais desastrosa: Portugal encontra-se em último lugar, em paralelo com a Grécia, significativamente afastado da média europeia.

Para além da infraestrutura básica de telecomunicações, em relação à qual os indicadores mencionados demonstram uma situação de atraso preocupante, é interessante observarmos alguns outros indicadores, mais próximos da sociedade da informação. A Fig. 4 apresenta o número de equipamentos ‘anfítrioes’ na rede Internet, enquanto a Fig. 5 indica o número de ligações Compuserve. Uma vez mais, a disparidade em relação ao centro da Europa é manifesta.
Fig. 2 - Avarias Anuais por Cada 100 Telefones e Percentagem de Reparações no Primeiro Dia Útil Seguinte

<table>
<thead>
<tr>
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<th>Avarias Anuais por Cada 100 Linhas</th>
<th>Avarias Reparadas no Dia Útil Seguinte (%)</th>
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<tr>
<td>Alemanha</td>
<td>14,0</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Suécia</td>
<td>8,8</td>
<td>94,5</td>
</tr>
</tbody>
</table>

Fonte: ITU, 1995

Fig. 3 - Comparação de Avarias em Linhas Telefónicas
(Avarias Anuais por 100 Linhas, 1993)
Este pequeno conjunto de indicadores evidencia que Portugal tem um atraso na infraestrutura de telecomunicações e na utilização dessa mesma infraestrutura para aplicações da sociedade da informação que é no mínimo preocupante. Apesar disso, há outros indicadores que mostram que o nosso país tem vindo a melhorar com rapidez. A percentagem de linhas ligadas a centrais digitais (Fig. 6) já nos coloca à frente de países como a Espanha, Itália e até da própria Alemanha, para esta última em virtude do estado deplorable da rede de telecomunicações na Alemanha de Leste.

A conclusão a retirar é que a construção da sociedade da informação em Portugal tem de vencer as barreiras resultantes do atraso na rede de telecomunicações, entre outras barreiras mais gerais associadas ao nível de educação e à capacidade organizativa. Infelizmente, ainda não será por agora que poderemos dispensar o auxílio decorrente da coesão europeia.
Fig. 5 - Linhas de Acesso CompuServe por 1 000 000 Habitantes

Reino Unido
Portugal
Itália
Irlanda
Espanha
Alemanha

Fonte: CompuServe

Fig. 5 - Percentagem de Linhas Telefônicas ligadas a centrais digitais (1993)

Fonte: ITU
6. Telecomunicações: Do Monopólio à Liberalização

É um dado assente que a sociedade da informação não se constrói sem o suporte de uma infraestrutura de telecomunicações capaz de transferir informação digital a velocidades de transmissão muito superiores às necessárias apenas para a voz. A existência de um serviço telefônico não garante por si o acesso aos serviços à distância que a sociedade da informação está em condições de oferecer. Assim, as questões da regulamentação do sector das telecomunicações e, em particular, a sua liberalização, são matérias fulcrais para a evolução e desenvolvimento da sociedade da informação.

As telecomunicações devem a sua generalização desde a invenção do telefone por Bell, à existência de monopólios nacionais. Foi esse facto que permitiu a banalização do uso do telefone ao tornar possível a existência de subsídios cruzados, em geral das chamadas internacionais e regionais para a utilização a nível local, de forma a financiar os volumosos investimentos necessários ao desenvolvimento das infraestruturas de telecomunicações.

No regime monopolista, a expansão do sistema de telecomunicações é orientada por considerações de ordem técnica do domínio da engenharia e, nalguns casos, subordinada a motivações políticas. Os custos totais do sistema são repartidos entre diferentes utilizadores e tipos de serviços, com a única preocupação de ajustar o custo total à receita total, com uma taxa de lucro considerada adequada à remuneração dos capitais investidos. As considerações de natureza comercial não influenciam de forma determinante as decisões de investimento. As afectações de custos e a distribuição dos investimentos prevalecentes no regime monopolista implicam um sistema complexo de subsídios cruzados.

Porém, a evolução tecnológica reduziu a importância da variável distância no custo efectivo das chamadas telefónicas. O custo real de uma chamada transatlântica pouco difere do custo de uma chamada de uma casa para a do lado. Isto deve-se ao facto das centrais telefónicas corresponderem hoje a computadores especializados e à elevada capacidade das ligações entre centrais, nomeadamente através de cabos de fibra óptica.

Estamos a assistir, deste modo, à morte do factor distância nas telecomunicações, com todas as implicações que daí decorrem para a estratégia tarifária das empresas monopolísticas. Os subsídios cruzados das chamadas internacionais e regionais para as locais tenderão a desaparecer à medida que a competitão entre diferentes operadores se intensifica.

Por outro lado, a sociedade da informação exige cada vez maiores velocidades de transmissão para as aplicações que está em condições de disponibilizar. É sabido que a inovação tecnológica subjacente à sociedade da informação no domínio das
comunicações tem capacidade de resposta a essas exigências. Contudo, as empresas em situação de monopólio têm menor apetência e motivação para integrarem a inovação tecnológica na oferta de novos serviços.

O movimento de liberalização dos serviços de telecomunicações iniciou-se nos EUA na década de oitenta, com a separação das empresas de telecomunicações regionais, do transporte telefônico de longa distância, que ficou a cargo da AT&T e da MCI entre outras. O movimento estendeu-se à Europa, primeiro com a privatização da British Telecom, a que se seguiu o empenho da Comissão Europeia na criação do mercado único de serviços de telecomunicações.

Num regime progressivamente mais competitivo, os custos dos serviços de telecomunicações são forçados a reflectir os custos subjacentes ao fornecimento desses serviços. As decisões de investimento serão orientadas pela procura dos utentes reflectida nas expectativas de proveitos futuros decorrentes desses investimentos.

Se por um lado as forças de mercado poderão forçar uma melhoria dos serviços de telecomunicações em resultado da pressão dos utentes para obter serviços capazes de satisfazer as suas necessidades, é igualmente verdade que poderão surgir efeitos preversos que conduzam a disparidades no acesso a serviços avançados e gerem desigualdades no sistema tarifário.

A procura de serviços de telecomunicações obedece a um padrão de definição geográfica e social que corresponde a uma maior concentração nos centros de negócio das áreas metropolitanas e nos parques de ciência e de escritórios na periferia desses centros urbanos. São precisamente estes centros que primeiro recebem os benefícios da emergência de serviços fornecidos pelos operadores em ambiente competitivo. Em regime de concorrência, os operadores tenderão a procurar servir as zonas e segmentos de mercado economicamente mais atractivos que permitem uma amortização mais célere dos vultuosos investimentos necessários à instalação das redes alternativas.

Esta concentração da provisão de melhores serviços de telecomunicações nas zonas com maior nível de centralidade interliga-se com a agenda da coesão, na medida em que as forças competitivas tenderão a intensificar os investimentos, com a consequente melhoria de serviços, precisamente nas zonas centrais. Em acréscimo, este desenvolvimento não homogéneo das pressões competitivas cria objectivamente condições para a inversão do sentido da subsidiação cruzada pelos antigos operadores monopolistas, que tenderão a subir as tarifas aos assinantes que estão fora do alcance da concorrência, para suportar os novos investimentos nas zonas centrais e responder à concorrência de preços e serviços nessas zonas.

É para combater a estratégia acima mencionada que se torna indispensável regulamentação específica através de várias medidas, nomeadamente pela definição de limites superiores para a variação de preços nas zonas em que a competição é insuficiente, pela obrigação de serviço universal e pela implementação de mecanismos contabilísticos que permitam identificar práticas menos aconselháveis numa perspectiva de interesse público e possibilitem regular o processo tarifário.
Tem de se aceitar como um dado que a competição em diferentes segmentos de mercado, em diferentes serviços e em diferentes áreas vai conduzir a desigualdades na sua oferta. Porém, prevalece a necessidade de alguma forma de regulamentação para as zonas com menor densidade de procura, para obviar que sejam precisamente estas zonas que venham a subsidiar de forma cruzada a provisão de serviços e os novos investimentos nas zonas centrais.

Este raciocínio pode generalizar-se à escala europeia. Os países periféricos sujeitos a menor nível de concorrência poderão vir a subsidiar indirectamente os países do centro onde a pressão competitiva é mais elevada e a procura de serviços avançados de telecomunicações é muito mais intensa. Este panorama corresponderia ao cenário chocante de serem os países mais pobres a financiarem o desenvolvimento da sociedade da informação nos países mais ricos do centro da Europa.

O argumento para a necessidade de acções da União Europeia para assegurar a coesão nos termos dos tratados vigentes, que tem sido uma prática constante ao longo das várias décadas de construção da Europa comunitária, está lançado. A Sociedade da Informação não se constrói sem uma infraestrutura moderna de telecomunicações. A liberalização dos mercados, neste e noutras domínios, é essencial para a inovação e para a melhoria de serviços em resultado da pressão competitiva. Esta, por sua vez, tenderá a beneficiar os países com maior nível de centralidade e que dispõem de uma procura mais intensa de serviços de telecomunicações avançados. Em face do risco das disparidades regionais se acentuarem ainda mais na União Europeia, é essencial que se definam medidas específicas de coesão, de molde a que a Europa entre como um todo na Sociedade da informação e lidere à escala mundial as transformações na organização da sociedade e na forma de viver, que daí decorrem.


CAP. 2

CASOS PARA A SOCIEDADE DA INFORMAÇÃO
2.1- Introduction

Phase II: Strategy Options for the Information Society

The purpose of this preliminary work on Phase II is to select the Portuguese sectors and public activities which, through the use of advanced communications, can improve regional competitiveness and welfare.

In a recent study about Portuguese competitiveness, Michael Porter (1994)\(^1\) identifies the main clusters first, according to their importance in terms of production; then, considering those sectors which have, or could have in the near future, strong internal and external links; finally, including those sectors where Portugal have a considerable degree of uniqueness.

In a strategic assessment about the telecommunications industry in Portugal (BIS Strategic Decisions, 1992)\(^2\) there is an identification of four Portuguese sectors with good perspectives in terms of growth of advanced communications uptake and use: financial services, tourism, manufacturing subcontracting and education.

The combination of these two selections, and the political and entrepreneurial involvement created around the elaboration of the Porter Report on Portugal, fits quite well the selection criteria proposed for the Project "IS and Cohesion". Therefore our selection departs from the identification of clusters undertaken in the Porter Report and - taking into consideration the availability of existing research - we pick up, and if appropriate add, those activities where the adoption and use of advanced communications can have greater impact on regional competitiveness and welfare.

This preliminary work on Phase II of the Project have two more sections. In section 2 we justify the selection of the sectors to be analysed in the Project. Section 3 identifies relevant organisations and actors for each one of the sectors to be analysed.

2.2. Selection of Relevant Sectors, Activities and Services.

In order to cover a large spectrum of the Portuguese economy and also to consider sectors strongly rooted in regions, the traditional groups defined by agriculture, industry and services were considered as relevant units within which the study sectors could be selected.

2.2.1 - Agriculture and Fishery

\(^1\)Porter, Michael (1994) - Construir as Vantagens Competitivas de Portugal, Cedintec, Lisboa.
\(^2\)BIS Strategic Decisions (1992) - Telecommunications Industry in Portugal, GATIE, Lisbon
Starting from eight clusters, which primary production represents 64% of the total production of the primary sector, and eliminating those sectors which do not have, or would not have in the near future, significant internal or external links, we get four main clusters strongly rooted spatially: dairy, fruits and vegetables, olive oil and wine.

From those, the Porter Report focus only the Wine Cluster because, arguably, when that study was undertaken the dairy sector had not yet built the necessary connections to improve competitiveness. Nowadays, after the restructuring process experienced by the dairy sector during 1994, this sector fulfills the criteria proposed by Porter, and because there is some cumulative knowledge about the adoption of advanced communications in the dairy sector, we think it is an appropriate value chain for the present study.

Figure I: Selection of Clusters in Agriculture


2.2.2. Industry

After the elimination of the sectors strongly concentrated in one or two firms, and picking up the industrial sectors which are relevant in terms of production and exports, the Porter report selects fourteen industrial clusters. From these only nine seem to have some potential to improve competitiveness. Furthermore, based on the potential to adopt and use advanced communications (BIS Strategi Decisions, 1992), we select Footwear, Mould and Car Components as appropriate value chains to consider in a first selection for the present study.

2.2.3. Services

2.2.3.1. Private Services

After the identification of private services with reasonable dimension (Banking, Insurance, Retailing, Telecommunications, Tourism and Transports) the Porter report selects Tourism due to its importance for the Portuguese economy (11.6% of the services' production and 80% of the services' exports). Tourism is also one of the sectors with good perspectives for the adoption and use of advanced communications. Thus, it seems to be a good sector to include in the present study.

2.3.2. Public Services

The Porter report selects relevant public initiatives according to their capacity to support the development of competitive advantages in the private clusters. Based on that aim and from a set of eight options identified by opinion leaders, five public sectors were selected (Education, Management Capabilities, Forestry Management, Financing and Science and Technology) and three were dropped out (infrastructures, bureaucracy and privatisations).

Education is the sector that fits both the selection of the Porter report and the identification of the sectors more keen to adopt and use advanced communications. Nevertheless, our study must consider issues not only related with regional competitiveness - where Education plays an important role as support activity - but also with regional welfare and thus Heath could be included as an alternative. Moreover, bureaucracy is not a crucial sector to support private clusters but play a
central role in the provision of public goods and in the improvement of welfare; thus bureaucracy could also be a key sector to analyse in this study.

2.2.4. Conclusion

Until now we have identified eight sectors suitable to be analysed in the Portuguese study are: dairy, moulds, footwear, cars, tourism, education, health and bureaucracy. The final selection, to be discussed with the core team and the other partners, depends on the desirable depth for each sectoral study. From table below it can be seen that - for the timetable proposed for the study - the depth of each sectoral study would decrease with the complexity (columns) of the sector and with the number of sectors (rows). The final depends on the methodology to be defined in Rome.

<table>
<thead>
<tr>
<th>Degree of Complexity -&gt;</th>
<th>Tourism</th>
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<td>6 Sectors</td>
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</tbody>
</table>

2.3. Portuguese Case Studies for the Information Society

Below are presented the case studies that have been selected in accordance with the core team strategy for the overall study: Dairy, Tourism, Footwear and Health.

32
I
Information Society and European Cohesion
Phase 2: Strategic Options for the Information Society
PORTUGAL
Dairy

Portfolio

DESCRIPTION
Contrary to many other Portuguese agro-industrial sectors the dairy sector (10% of the agriculture production of Portugal) registered a steady increase both in productivity and employment from 1986 until 1992. Nevertheless, after the full application of the European rules, in 1991, it experienced a strong restructuring process leading to the horizontal integration between dairy producers and to the vertical integration between producers and distributors. Interestingly this phenomenon seems to be closely associated with the geography of uptake and use of advanced communications and the spatial structure of the surviving value chains become significantly different from the previous ones, with more coordination activities transferred to central places and less market power at the periphery, where dairy farming, milk collection and primary processing takes place.

RATIONALE AND HYPOTHESIS
From the restructuring process synthesised above it is clear that the diffusion of advanced communications can, on the one hand, support a better integration of peripheral producers in core regions; notwithstanding this, on the other hand, the diffusion of advanced communication is also associated with the reduction of the market power of peripheral producers.

The final outcome in terms of the influence of advanced communications in the competitiveness of peripheral producers - an thus on regional development - is still fairly unknown. Nevertheless, some questions could arise suitable to be addressed by the case study:

a) After the restructuring process of the dairy value chains, what will be the new information systems - moulded by information technologies - of the restructured companies? Will the diffusion of information technologies reach, in the near future, the collecting and farming stages of the chains? Will this diffusion also change the nature of contracts with farmers and collectors?

b) Can the restructured Portuguese dairy value chains - pervaded or not with information technologies - compete with the logistics of the French and Spanish milk or with an improved management of the dairy multinationals already established in Portugal? What will be strength of each one of these different competitors - with various abilities to handle information - when another CAP reform will take place?
Case Study

1) Characterisation of the Sector

The Portuguese dairy sector is - from all the agricultural sectors - an appropriate choice for this study because it has potential to grow, it has important connections within Portugal and it is experiencing a strong restructuring process closely associated with the uptake and use of advanced communications (Figure 1).

The processing phase of the dairy value chain has more than 10000 employees all over Portugal distributed between 100 companies. Nevertheless most of the market is controlled by three co-operatives in the mainland, themselves trying to merge with each other into one big group to face external competitions.

Figure 1: The Spatial Structure of the Portuguese Dairy Value Chain

Before the full adoption of the European regulations in 1991 there were collection and distribution areas allocated to the various co-operatives and companies and - because the processing plants had the obligation to collect and distribute with similar prices in their own area - the production was fairly dispersed. After 1991 the European common market organisation for milk and dairy products forced the external and internal competition between processors and one of the outcomes was the spatial concentration of production in the regions with better conditions: in the Northwest of the country (60%) and in the major two islands of the Azores (20%); there, differently from the mainland, production is processed into non-fresh products as powdered milk and cheese. As a crude estimated, the employment in dairy farming in Portugal involves around 80000 jobs located around the major processing plants (see figure 1).
2) Actual Information Systems of the Portuguese Dairy Value Chains.

Figure 2 presents the more important structures of the dairy value added chains. The image - based in interviews and suitable to be adjustable to the value chain model - is useful to explain a set of interesting things related with the dairy value chain information systems. These chained information systems are divided according to the actors involved: farmers, processors, distributors and costumers.

The farmers' decisions about the product mix (beef or milk) and the production factor mix (feed or pasture) are closely associated with the information invoiced by the processor (Milk quality, milk quantity, and milk prices). This information is usually carried by paper directly exchanged in the milk collection station or in collective or private parlours.

At the processor's level there are three main decision structures which have direct consequences upwards and downwards the value chain3:

Figure 2: Structures and Flows of the Dairy Value Chain

1) The Purchasing Policy takes into account the margins allowed by the production process and the milk prices practiced in other areas and decides the price of milk considering the farmers' reaction; nowadays, due to the lack of appropriate telecommunications and energy infrastructures at the milk collection stage, it seems quite impossible to rationalise the complex and costly information system that occurs between farmers and processors with the use of information and communication

3Certainly there are other important decisions for the processors, namely related with financial, labour and investment issues; however, they have more reduced implications upwards and downwards the value chain than those decisions more focused on inbound, internal and outbound logistics.
technologies; therefore the channel of communication still is the paper transferred by hand (carried by the truck driver) or by mail.

2) The Planning of Production (product mix) processes internal (inventories, production costs, milk quantity - seasonal variations - and milk quality) and external data (demand by product, prices) and conveys decisions concerning the time and the amount of production for each alternative product (cheese, powdered milk, ultra pasteurised milk or other). The adoption and use of information and communication technologies within Planning of Production differ considerably from one firm to the other (some firms can use computer planning devices and others use less sophisticated tools); nevertheless, concerning the communication with other functions of the value added chain, the media still is mainly the voice, the paper and the telephone.

3) The Sales Policy system receives information about the level of inventories, the demand for products and respective market prices, and builds decisions related to sales conditions, advertising, choice of alternative customers and the timing of sales. Related with Sales Policy, information technologies are not only more diffused but evolving; nowadays there is a current use of faxes and transference of diskettes (by hand or by mail), nevertheless there are well developed plans to expand the use of terminal emulation systems which enables and stimulates the vertical integration between processors and distributors.

The communication between the distributors and the customers - usually large malls located in Lisbon and Porto - is based on paper (sent by mail), telephone and fax. Yet there are good conditions to introduce EDI systems to reduce the transaction costs between these two types of economic actors.

3) Potential Information Systems of the Portuguese Dairy Value Chains.

During 1994 there was a big restructuring process in the Portuguese dairy value chains with the vertical integration of processors and distributors and also an horizontal integration roughly according to the geographical distribution of the value chains (Azores, Northwest and Lisbon). This movement - pushed by the introduction of the European regulations in 1991, supported by the capabilities of new information technologies and, forced by the increasing market power of giant malls and big banking structures (both sustained by new ICT).

The spatial structures of those new chains tend to be completely different from the previous ones (figure 3), with more coordination activities transferred to central places and less market power at the peripheral level. Furthermore, the restructuring process itself is leading to a more specialisation of the production systems and to information systems strongly based on information technologies.

Furthermore, a better integration between peripheral productions and central demands is leading to a reduction in the processing of intermediary products such as powdered milk and a rise in the production of final goods such as cheese. Better logistics is also enlarging the space of competition not only downwards the value added chain in the markets of Lisbon and Porto - where the French ultra pasteurised milk increasingly rivals with the Portuguese - but also upwards the value added chain where there is still space for new entrants with modernised technologies - as exemplified by the creation of two recent factories in the Azores and the entry of Parmalat in the Portuguese market through the acquisition of a failed co-operative near Lisbon.
The functions, decisions and information flows of these new production systems are similar to those presented before in Figure 2. There are, nevertheless, remarkable differences in the adoption and use of information technologies, in the location of control from peripheral to central areas (see in Figure 4 the new position of the centre periphery divide) and in the emergence of new markets and new competitors.

Although there is a tendency for the specialisation of each one of the spatially rooted dairy value chains according to the source of the raw material (differentiated cheese and milk for France; common cheese, butter and powdered milk for the Azores; and normal milk for the Northwest) there is also some space for competition between the different value chains. Therefore, there is a stimulus to reduce costs, to improve management and to increase the barriers against new entrants along the value chain, namely through the design, adoption and use of information and communication technologies.

Figure 4 presents also the type of information and communication technologies that could be adopted and use along the restructured dairy chains. From the interviews we were able to do near the processors, the potential improvements on the previous situation are:

a) The exchange of information between the collection stations and the factory, involving data about milk quality and quantity, payments to farmers and, eventually, information on farmers. This can be done using a system based on the emulation of terminals between the collection stations and the factory.

b) The coordination of the internal planning and logistics and the centralisation of the accountancy systems. To undertake these information tasks it would be necessary a
corporate network to connect terminals in the factory with terminals in the headquarters located in Lisbon or in Porto.

c) The introduction of integrated systems - such as EDI - in the transactions procedures that occur between the processor/distributor and the big customers. Once more an integrated system would be necessary to connect the processor/distributor with the big malls and eventually with other smaller customers.

Figure 4: Potential Use of Information and Communication Technologies.

However, to improve the competitiveness in relation to the French producers through the adoption of information and communication technologies it seems important to diffuse the use of these technologies into the stage of milk production. Nevertheless because most of the Portuguese dairy farmers have not sufficient knowledge to deal with information technologies the solution is to create "information nodes" suitable to transfer useful signals to the farmer's decision systems (product and factor mix). There are two possible types of "information nodes":

d) One is the milk collection station where, with the availability of milk records, it is possible to develop various types of analysis and services useful for the farmer: individual cow milk analysis, milk yield forecasting services, fertility monitoring services, etc.

e) The alternative information node is the bank which can have one terminal in the milk collection station and, through that, not only reduce the transactions costs between producers and processors but also to give the farmer all the necessary financial information and services.
3) Potential ICT systems for the Portuguese Dairy Value Added Chains.

Following the value added chain there are three main links that can be pervaded with ICT systems: one connects the milk collection stations with the factories; the other links the factories in the periphery with the headquarters in the main towns; a final one joins the processors/distributors headquarters with the big costumers.

Let us look at each one of these connections trying to analyse, in the next section, issues like accessibility and affordability, which will feed the final report about the Strategic Options for the Information Society.

a) Transfer of files between the collection stations and the factories.

Each collection station must have a personal computer and an asynchronous modem. In the factory it is necessary to have a middle size computer, possibly with UNIX 1 or OS400; or, alternatively, a network of computers connected via an X25 line with sufficient virtual channels, where the management of communications would be guaranteed by the telecommunications operator through a public PAD.

There is already suitable software (for instance Kermit) to perform the file transfer between different operating systems. Figure 5 below presents the structure of this system.

Figure 5: System to Transfer Files Between the Milk Collection Stations and the Dairy Factories

![Diagram of milk collection station network]

The communication costs associated with this system are as follows:

- At the factory it is necessary to have a X25 board and associated software which cost, for small machines can be around 1000 ECU. A synchronous connection for 19200 baud with 8 SVC costs monthly around 310 ECU, including the modem.
- At the milk collection stations there must be a personal computer - which costs less than 1000 ECUs - and an asynchronous modem at 9600 baud - which lower cost is 125 ECUs. The asynchronous connection rate by month is about 15 ECUs for a connection with 9600 baud.4

b) Communication System to connect the dairy factories, in the periphery, with the headquarters, in the centre.

There are two different ways to undertake this connection:

- One is to establish a connection between the computer network in the factory and the computer network in the headquarters. This system is rather flexible and allows to share resources (files, printers, communication boards, etc.). Nevertheless, this system is also more expensive because it requires a high speed line (minimum 64 Kb) and two remote bridges.

- The other solution is cheaper but not so flexible. It is mainly a interconnection between the two computer networks (one in the factory and the other in the headquarters) through a X25 link. The cost of this connection varies according to the infrastructure already in place; for instance, with a established X25 connection the cost is mainly operational.

These two solutions are presented in Figure 6. The costs associated with those two solutions are as follows:

- For the first solution each "bridge" has a fixed cost of at least 2000 ECUs; the operational costs of a high speed link varies a lot according to the distance of the closer digital switch and the closer commuter node of the telecommunications operator. The minimum monthly cost would be 750 ECUs but that real figure can easily be twice that sum. These connections are not paid according to the traffic.

- For the second solution (supported by a X25 public network) the cost can be just 5 ECUs per month more the payment of the traffic (2SVCs) if either the system of the factory or the network of the headquarters already had the connection to the public network X25. If that connection is not already established, then the cost must include the hardware and software X25 for both systems (minimum 1000 ECUs per system), the connection (250 ECUs per system) and the traffic.

c) EDI System between the dairy headquarters and the big malls.

Assuming that the big mall are already equipped, the minimum requirements to implement an EDI system with the dairy headquarters is a personal computer connected with an asynchronous modem. The function of that computer is to receive, process and transmit messages and it must have a specific software to perform those functions. If the dairy headquarters already have a X25 connection, that line can be used also to exchange data and, therefore, the asynchronous line would not be necessary.

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4Notice that, for instance, in the Northwest of Portugal one co-operative has 21000 producers and 3000 collection stations and the milk delivered by each producer must be submitted regularly to 4 or 5 different laboratory tests.
Figure 6: Communication System to connect a Dairy Factories with the Headquarters.

Dairy Factory (1st solution)  

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Headquarters (1st solution)

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Dairy Factory (2nd solution)  

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Headquarters (2nd solution)

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It is also possible to base the system on a UNIX or AS400 machine established in the dairy headquarters, and to install the EDI software in that equipment, saving the cost of an extra personal computer. Yet, in this case the cost of software specific to EDI is higher. To implement an EDI system it is also necessary to define a mailbox in a compensation centre for EDI. Messages are invoiced through this mailbox to the different partners of the EDI system.

In the Figure 7, below, we present two possible connection structures between the dairy headquarters and the big malls. The first one is much simpler than the second. Excluding the costs of the internal networks the cost of the EDI system is the following:

To implement the first solution there is an initial cost for an asynchronous modem and for the EDI software appropriate for a PC. The cost of the modem begins in 125 ECUs and the software costs about 2000 ECUs. Monthly the access cost for an asynchronous modem is 15 ECUs (for 9600 baud), and the EDI mailbox around 12 ECUs more expenditure on traffic.

To implement the second solution and assuming that each system already has the board and the software appropriate for the X25, the initial cost would be the software EDI for a UNIX or AS400 system which can go from 3750 ECUs to 15000 ECUs according to the equipment. The synchronous access at 9600 baud costs 210 ECUs per month, including the cost of the modem. Nevertheless if there is already an X25 line in the dairy headquarters, then it is only necessary an additional SVC with a monthly cost of just 2.5 ECUs. There is aswell a monthly cost for the EDI mailbox and for the traffic.
Figure 7: EDI System between the dairy headquarters and the big malls.

The company responsible for some big malls in Portugal (SONAE) is already involved in some project studies with their suppliers using a subset (EANCOM) of the EDIFACT standard. It is this standard which tends to be used in Portugal by the big malls. SONAE also supplies a particular software developed internally that facilitates the conversion of messages, having as well some functions connected with inventory management and invoice administration.

4) Barriers and Prerequisites.

There are technical, economic and sociological barriers that hinder the development of these new systems.

Technical Barriers

Rural level:

At the milk collection stage - in big farms, in collection stations or in collective parlours - there must be telecommunication infrastructures with a minimum capacity of 9600 bauds. In many places there is not these facilities; hence a different system based on computers installed in trucks has been studied.

Local Level

- At the processing stage - in local cities - there must be telecommunications infrastructures with enough capacity to support an X25 connection or, alternatively, a line with the minimum capacity of 64 Kb.

Metropolitan Level
- At the distribution stage - in the regional capitals - there must be telecommunications infrastructures able to connect with the local level. Either sufficient to support an X25 connection or, with a better solution, with a minimum capacity of 64Kb.

Suburban Level

- In the linkage with the big malls - usually located in the suburbs of the regional capitals - there must be telecommunications infrastructures suitable to connect, through a X25 system, with the centre of the respective regional capital.

Economic Barriers

Rural level - Local Level

- The rebalancing of tariffs will increase the price of calls between the collection stage and the local commuter. This will hinder the competitiveness of the dairy value added chain at the collection stage. Furthermore, the equipment - a modem and a computer - is not high at is not very high in absolute terms, it can be quite high when related with the reduced amount of milk collected in each station.

Local Level - Metropolitan Level

- The connection between the processing plants in local towns and the dairy headquarters, in regional capitals, is not much influenced by the rebalancing of tariffs, since most of the communications will be carried by an X25 system.

Metropolitan Level - Suburban Level

- The same happens in the connection to be installed between the dairy headquarters and the big malls in the suburbs.

Sociological Barriers

Rural level:

With the actual employees in collection stage - in big farms, in collection stations or in collective parlours - it would be quite difficult to operate successfully the proposed information system, based on new information technologies. Nevertheless, there are certain collection areas where that diffusion is possible which would have demonstration effects in other zones; moreover, when competition forces the rationalisation of the process.

Local, Metropolitan and Sub-urban Levels

At the other stages of the value added chain there is no visible barrier. Only the type of market relations between processors/distributors and big customers can influence the adoption and use of the EDI system between these two types of actors. Nevertheless the influence is more on the design of the EDI system rather than on the adoption or non adoption of a value added system.

5) How to move forward?

From the previous section it is clear that the main constrains to the diffusion and use of information technologies by the dairy value chains are at the rural level, near the farm and the collection stations. It is there where the regional development agenda has its roots and it is there where some action must be undertaken. - First in the provision of minimum (9600 baud), reliable and affordable telecommunications facilities;
Then, related with the demand push, it is important both to secure the "innovative" competitive environment between alternative value chains, and to stimulate the adaptation, adoption and effective use of new information technologies. The idea of pilot projects (in the most remote areas but with good natural conditions for production) could have good demonstration effects in other areas without hindering the necessary competition.

There are two pilot projects that can be selected from this case study:

a) One refers to the implementation of an information system, based on advanced communications, suitable to rationalise the collection stage and able to avoid the elimination of small farmers of the dairy chain that must always deliver their milk through a collective collecting station.

b) The other has to do with the design of farmers' information systems suitable to use effectively the information processed at the collection stage. Actually, a whole sort of computer services based on milk records could be developed: individual cow mil analysis, milk yielding forecasting service; fertility monitoring service,... and the impact on the farmer's competitiveness would be great.
II

Information Society and European Cohesion
Phase 2: Strategic Options for the Information Society

PORTUGAL

Tourism

*Portfolio*

DESCRIPTION

The Portuguese share in European tourism rose, in number of tourists, from 1.4% in 1980 to 2.9% in 1990. This same evolution can be verified in terms of net touristic receipts: 1.9% in 1980 and 2.5% in 1990. The total number of tourists in Portugal is not great (8 million in 1990), specially when compared with Greece (8.7), Spain (34.3), Italy (26.7) and France (50.0); nevertheless the importance of touristic net receipts in the Portuguese GDP is quite high (5.5% in 1990), mainly if related with Greece (4.6%) Spain (5.3%) Italy (1.6%) and France (1.4%). This importance and inevitable dependency associated with it generates problems and rises challenges, moreover when the touristic development registered in the eighties is showing alarming signals of exhaustion and there is an increasing competition from new touristic places.

The structural disequilibrums of the touristic sector in Portugal are similar to many other places: dependency in the product "sun and sea"; geographical concentration of supply; seasonal concentration of demand; great dependency on the Spanish and British tourists; an important weight of non registered supply of beds; the overwhelming control of touristic distribution by international operators and the lack of skilled labour.

To answer these problems the Portuguese government prepared a strategy for tourism development for the nineties with four main guidelines: quality improvement, greater professional skills, product diversification and market diversification. This guidelines are operationalised in a support scheme of the private sector to stimulate the build up of touristic equipments, training and marketing.

RATIONALE AND HYPOTHESIS

Astonishingly, although it is pointed out by some studies that the touristic sector would be one of the major up-takers of new information technologies, there is not any reference to those pervading technologies in the Government strategic plan for tourism. And this, even when one of the structural problems of the Portuguese tourism are strongly connected with the management of information by international operators. This fact can be justified by the spatial structure of the touristic value chain, where touristic operators - the main processors of information in the touristic sector - are usually located near the demand sources.
Two questions are interesting to analyse in the case study:

- In which concerns traditional tourism, and in order to maintain the competitiveness of the Portuguese touristic sector, would it be sufficient to improve the quality, to have greater professional skills, to promote product diversification and to search for different markets; or, otherwise, this type of tourism can only survive with increasingly reduced value added?

- Related with cultural, business and environmental tourism, which supply can rise in Portugal in the next years due to the national support schemes, the question to be asked is what information system will guarantee the sufficient demand to fulfill that increasing supply and what companies will control those information procedures?

**Case Study**

1) **Characterisation of the Sector**

The tourist sector represents 1.2 million firms in Europe, 95% micro firms with less than 9 employees. 9 millions of direct job representing 6% of total employment. 45 to 65% of women labour according to the member states. France, Spain and Italy receive 66% of international tourists and 58% of the tourist income. France is actually the biggest touristic country in the world. Nevertheless, among the European countries, the importance of tourism in the economy is higher in Greece, Spain, and, particularly, in Portugal where tourism contributes to 5.5% of the GDP and touristic receipts cover 40% of the Trade Balance Deficit. The integration of Portugal in the European Community in 1986 reinforced Portugal as a touristic destiny and increased the entrance of European tourists in the country.

In Portugal, almost 50% of tourists come from Spain (4 million) using road excursions, but they only represent 10% of the hotel nights. Most of the other tourists arrive by air (64%) and also by road (28%) from the United Kingdom (13% of tourists, 31% of hotel nights), from Germany (8% of tourists, 14% of hotel nights), from the Benelux (6% of tourists, 11% of hotel nights), from Scandinavia (2% of tourists, 6% of hotel nights), from North America (3% of tourists, 6% of hotel nights), from France (8% of tourists, 5% of hotel nights) and also from other places (10% of tourists, 17% of hotel nights). The average tourist stay has been decreasing steadily, from 11 days in 1980 to 7.4 days in 1990 but it varies considerably according to the nationality of the tourists: Canada, 16.5 days; Holland, 14 days; Germany (13, 1 days); UK (12, 7 days); and Spain (4, 9 days). This figures are consistent with the fact that northern countries have the highest propensities to travel and national tourism is more important in the Mediterranean countries (84% to 87% of the national tourists travel within the country); in Portugal this rate is the highest of the community (90%).

Hotel capacity is relatively spread across the country; nevertheless tourists are more attracted to the Algarve (39.1% of hotel capacity and 40.0% of hotel nights) to Lisbon (19% of hotel capacity and 23% of hotel nights) and to Madeira Island (7.5% of hotel capacity and 14.2% of hotel nights); the rest of the country (Northwest, Mountains, Central Coast, Azores, and Southern Plains) has 35% of the hotel capacity but only
23% of the hotel nights. There is a strong seasonal variation and 40% of the tourists arrive in just three months of the year (July, August and September); UK tourists are more spread along the year than Spanish or German tourists, mainly because they search also for different attractions like golf and longer retirement holidays.

Figure 1: The Spatial Structure of the Portuguese Tourism Value Chain

Figure 1 presents the spatial structure of the Touristic Value Added Chain rooted in Portugal. The picture transmits various ideas: first, the existence of three main touristic areas within Portugal - the Algarve, Madeira and the Lisbon area; second, most of the actors of the value chain - agencies, tour operators and airlines - are based outside each one of the touristic regions; finally, and as stressed before, apart from Spanish tourists, most of the others travel by air reinforcing the insular features of the Portuguese touristic regions.

Compared with other touristic countries (Table 1) Portugal presents a quite unique position: it has disadvantages related with distance, with the lack of appropriate transport systems namely secondary airports, and with the overwhelming control of touristic distribution by international operators. It has also some advantages like the image of a relatively unknown destiny, the variety of landscapes within a relatively small area, a nice climate for sports in winter like golf, fishing, hunting and walking.

It is fairly consensual in Portugal\(^5\) that - against the Mediterranean Basin which has more than 10 million beds and, generally, a better climate - it is useless to develop a competitive strategy for the Portuguese tourism based only on low prices and mass tourism. The advisable strategy is to improve and potentiate quality and diversity which, beyond other things, contributes to the development of remote regions and localities, where that quality, diversity and uniqueness can be carefully used for tourism. These ideas are also stressed by Alexandre Relvas\(^6\), Secretary of State for

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Tourism, who says that a new cycle of sustained development in the Portuguese Tourism is only possible if based on quality, skillness, and diversification of products and markets. The strategy planned for the sector is based on six main policy measures: to diversify the supply reinforcing the capacity of other touristic areas like the Azores, Madeira and Douro; to reinforce the uniqueness of Portugal and its regions; to create an image in external markets like “beaches in the Caraíbas, or “islands in Greece”, “what else for Portugal”; to develop animation; to improve support infrastructures; and to manage dimension.

Table 1: Relative Advantage of the Portuguese Tourism

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<th>Greece</th>
<th>Turkey</th>
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Summing up, according to the existing common sense, Portugal can ameliorate its touristic competitiveness; first, through improved animation of unique touristic attractions located in unexploited areas in order to obtain a more intense use of the existing possibilities; second, through better transport systems and other support infrastructures; and finally, through better marketing procedures7. As can be seen in the following sections, information technologies can play a major role for all of these aims.

2) Actual Information Systems of the Portuguese Tourism Value Chains.

Figure 2 presents the more important information, technological and institutional structures of the touristic value added chain. The image is useful to highlight two important ideas:

7According to Gallup [Book on Tourism - General Department for Tourism 1991, p.113] favourable opinions of UK nationals about Portugal are quite different comparing people who already visited Portugal (A) with those who have not yet visited the country (B): clean seaside (A-61%; B-36%); night security (A-51%;B-26%); price of food (A-54%; B-20%)
- One is that some of the actors involved in the chain - particularly operators, local operators and tour agencies - are mainly information processors and their adoption and use of advanced communications is imposing remarkable effects at three interrelated levels: first, by changing the role of operators and agencies in the touristic value added chain; second, by modifying the performance of transport systems, marketing procedures and touristic animation; and finally, by changing the competitive environment in international tourism and, necessarily, the distribution of costs and benefits among the various actors of the touristic value chains.

- The other idea that arises from Figure 2 is that, apart from the processes of competition, co-operation and bargaining between the various actors of the touristic value chain, there is a remarkable competition between different information systems, each one of them associated with a particular design of information technologies.

Looking at Figure 2 the main information flows along the value added chain begin at the agency located usually in Northern Europe which - answering the demand from a potential tourist - can either request the service from a tour operator (IS A) which - as an wholesaler - manages the system at a large scale or, alternatively, book the hotel and the local services in Portugal, with the eventual collaboration from the local operator (IS B).

IS-A) If the agency requests the service from a tour operator, it just have to book a place for its customer in some previously organised holiday programmes or touristic circuits. Tour operators organise holiday programmes or touristic circuits using the allotment system through which rooms and other services are acquired on advance, usually through the intermediation of local operators. The co-operation between tour operators and local operators is also required for all the actions related to the reception of tourists in Portugal: accommodations, transfers between the airport and the hotels, car renting, etc. In this system the information circuit beyond the tour operator involves four steps: the tour operator demands a reservation to the local operator - by fax; the local operator confirms the hotel reservation to the tour operator - also by fax; the tour operator sends the voucher to the hotel by paper mail; and, finally, the hotel sends the invoice and the voucher to the tour operator - also by paper mail.

IS-B) If the agency books the flight, the hotel and the local services without the intermediation of a tour operator the information system is more direct but involves more information exchange. Through the use of fax or telephone, the agency demands a room, receives the respective availability and books the hotel; through an integrated system, and for special cases by fax and telephone, the agency also books the flight. Then the agency gives its client a voucher - a paper. Afterwards the agency receives from the hotel and the airline company, the voucher with an invoice for payment - using paper mail. To enlarge the possibilities of booking and to address other local services in Portugal, the travel agency can collaborate also with the local operator exchanging information by fax and telephone.

As seen above most of the information connections along the touristic value added chain are made by fax, telephone or paper mail: Nevertheless there are as well fairly spread telematic information systems used to book flights, rent-a-car and some hotels too. The three systems in use in Portugal are GALILEU, owned 50% by European airlines: Luftansa, British Airways, Air Portugal, and other airlines; AMADEUS,
controlled by Iberia and Air France and PARS, based in the United States. GALILEU is accessed by 350 agencies in Portugal.

Figure 2: Structures and Flows of the Tourism Value Chain

The more important tour operators also have powerful information systems. For example Abreu Agency - one of the biggest in Portugal - has an internal network - connecting the agencies with the main operator - carrying two working systems: one working system is internal (for accountancy, invoice confirmation and vouchers); the other working system is external and can book, through AMADEUS, GALILEU or PARS, flight, hotels and rent-a-car. These systems are naturally evolving and the following section analysis some of the main trends.

3) Potential Information Systems of the Portuguese Tourism Value Chains.

The structure of the sector is changing considerably along the last decade and most of these changes are associated with the diffusion and use of advanced communications along the value added chain.

First there is - down the value chain (hotels) - a progressive decrease of small marginal equipments and reinforcement of hotel associations.

This evolution follows what already happened in the United States where the integration between various hotels in many different places is accompanied by the segmentation of the market through which each type of customer receives specific accommodations and services without much surprise from one place to another. This concentration allows economies of scale in the processing of information namely regarding marketing, booking and even the production process which become much more standardised among the chained hotels.

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8GALILEU was formed in July 1987 as a joint venture to develop a global solutions to the demands of the travel industry for information and computerised reservation systems (CRS). In September 1993 a new company was formed through a merger between Galileo and Covia, forming Galileo International. Galileo International is located in Denver whilst a Product Development Centre for Europe, Middle East and Africa is located in Swindon, England. The ownership structure gives the European partners 50% of the company. National Distribution Company distributes the Galileo product. In Portugal it is responsible for planning and managing the deployment of the Galileo product to the Portuguese market.
Second, based on the possibilities allowed by advanced communication systems, there is also a movement of concentration in the beginning of the touristic value added chain, between travel agencies, tour operators and also local operators near the touristic attraction.

Finally, in the middle of the touristic value chain - particularly starting from the existing booking systems Galileo, Amadeus and Pars - there is a movement to include in the information system the possibility to do transactions between many other actors upward and downward the value added chain. Rent-a-car, communications services, hotels, ...

These organisational restructurings, the expected increase in global tourism (a rise of 50% from 1995 to the year 2000 according to the Touristic World Organisation), and the increasing competition between places (for the first time supply is becoming bigger than demand for mass tourism) is imposing new challenges to the national touristic actors and to the governmental institutions that support them.

Figure 3: The New Spatial Structure of the Portuguese Tourism Value Added Chain

The Portuguese actors try to react using similar strategies. For instance, as happens with hotel companies outside Portugal, TURIHAB created an information reservation centre involving 60 housing tourism resorts spread across the country with 5000 beds; Utell, an international chain with a branch in Portugal, integrated various small and medium size hotels in Lisbon; Pestana Group in Madeira established a network involving various hotels in Madeira; and there is a project to connect most of the thermal resorts within Portugal. In which regards the beginning of the value added chain, also in Portugal, big tour operators are now associated with a network of travel agencies and with close links with international operators. Finally, also TAP keeps a close connection with Galileo network system and tries to establish associations with rent-a-car, hotels and communication services.
However, in terms of political support for the diffusion and use of advanced communications in the touristic sector there is a remarkable gap in the Portuguese support schemes; actually - the main support scheme for tourism - named SIFIT - is mostly target to infrastructures and financial support which reduces the fixed costs of the touristic companies but - because the purchase of rooms by international operators is virtually monopolistic - most of the benefits go to those big operators and also to the banks. Only recently, the operational programme for the SME initiative proposes a project, supposedly promoted by the Portuguese Association of Travel Agencies, to connect all the Portuguese travel agencies and, afterwards, also the international tour operators. Furthermore, promoted by the government, there is a strong marketing campaign, both outside and inside the country which, as argued by its manager, will only get significant results with a significant change in the local operators; those able to change will survive, the others won’t.

With these movements the new spatial structure of the Touristic Value Added Chains rooted in Portugal will tend to be significantly different. Comparing Figure 3 with Figure 1 the expected changes are clear. First, although for small scale tourism, two or more areas will tend to become more relevant as touristic attractions: the Azores islands and the Douro valley have both the capacity and the political will. Second, the expected networking between Portuguese travel agencies and hotels will allow - if properly managed - the creation of a big national networked operator able to substitute or complement international ones. Third, the national tourism will tend to increase, namely based on a better distribution along the year and using improved road accessibilities within Portugal. Finally, a bigger competition between airlines in the connections with Madeira, with Portugal mainland and with the Azores, will change the structure of the transport system; from regular, expensive and overbooked flights to more flexible, cheaper and demand adjusted flights.

Figure 4: Potential Use of Information and Communication Technologies.

Comparing Figure 4 with Figure 2 it is also clear that the information, technological and institutional configuration of the restructured touristic value added chains are
slightly different from the previous ones. Beyond the restructuring processes envisaged above, Figure 4 highlights the existence of two alternative information systems for the touristic value chain, each one of them associated with a particular distribution of control and results:

IS-C) One of these alternatives derives from the merging process between agencies and tour operators and their association with airlines and oversea operators, all of this supported on telematic systems. With this expected structure, tour operators will become more flexible and, based on an easy booking system run on advanced communication systems, will organise holiday programmes or touristic circuits for any demand size; actually, based on automatic booking and automatic payments the service can virtually be provided either to one person or to one thousand. Even the allotment system - on hotels or even flights - will become less rigid because firms can easily sell and buy rooms through and a telematic network connecting operators, agencies, hotel chains and airlines.

IS-D) The other alternative is associated to the adoption and use of information technologies by most of the hotels and also by the final customers using Internet or some other global network system. If that happens then it would be possible for the customer to virtually by pass the system created by the tour operators and book directly the hotel and the flight.

These two solutions can live together competing with each other. The imposition of the first one would lead to a greater dependency of hotels and local operators from big international operators. The supremacy of the second would virtually eliminate the need of tour operators and tour agencies.

4) Potential ICT systems for the Portuguese Tourism Value Added Chain

As said before there are several reservation systems (Galileo, Amadeus, World span) that can connect tour operators and agencies with airlines and hotels. These systems are mainframe based and are usually accessed via X25. The access to the system includes the PC and software so, if a operator wants to access several systems, he will have several terminals on his desk.

The first and most simple solution to this problem is to integrate the several reservation systems of the various touristic companies (Figure 4 - IS C). This can be achieved using a front-end machine (here called central reservation system) which is connected with all the reservation systems and dialogues with them. This system can be accessed by agencies and operators via a single personal computer with a client-server application or a terminal emulation. These connections can be seen as dashed lines in figure 5.

The other solution is to expand the access to the reservation system also to small professionals and individual customers (IS D) which is probably not very well seen by the operators and agencies, because this access will short circuit their usual profit. Instead, hotels, airlines, service providers and customers will benefit. One way to develop this solution can be the connection of the front-end system to a public value added network like internet, compuserve or Microsoft network. There, the user can collect all the information like prices, schedules, etc. and access some reservation functions. The small service provider can offer his services with less investment. This solution can be seen as dotted lines in figure 5.
The costs associated with these solutions are as follows:

- In the hotels, operators, agencies and airlines, it is necessary to have a small system with a X25 board and associated software which cost can be around 2000 ECU. Most of them will already have their own systems, so they will not need to make this investment. The terminal emulation can have no cost and the client-server application can be part of the access cost to the reservation service. A synchronous connection for 19200 baud with 8 SVC costs monthly around 310 ECU, including the modem, but several of the intervenients should already have at least one available. The cost of the access to the central reservation system is difficult to establish, because it is an inexistant service.

- The users and small service providers only need a personal computer - which costs less than 1000 ECU - and an asynchronous modem at 9600 baud, which lower cost is 125 ECU. The monthly asynchronous connection rate is about 15 ECU for a 9600 baud connection. The internet service connection costs about 2 ECU per month plus traffic.

4) Barriers and Prerequisites.

It will be through the competition of those two systems (ISC and IS D) that tourism in remote areas can be developed without being completely dependent on tour operators. Tour operators unveil new destinies and generate sufficient and scheduled demand; local hotels in remote areas can hopefully deal with different tour operators and, usually after a first contact with particular tourists, create with them, or with their friends and relatives, direct connections.
There are technical, economic and sociological barriers to the development of these two solutions. The following analysis suggests that the first solution seems more likely but it also unveals the policy tools suitable to facilitate the second solution.

**Technical Barriers**

In remote areas with touristic potential:

The telecommunication connections with remote areas, like small islands in the Azores and deep valleys in Douro region are quite unreliable, expensive and slow. Therefore it would be difficult, under the present circumstances, to introduce integrated systems between the tour operators in the North of Europe and local resorts located in those areas. Even telephone and fax are often difficult and expensive to operate.

In the Portuguese traditional touristic areas

In the touristic traditional areas in Portugal - there must be telecommunications infrastructures which support X25 connections to guarantee the connection with tour operators located in Northern Europe. There is already availability of X25 connection in all territory. Yet, it is also necessary to have fax and telephone connections and these are quite bad in some traditional areas like the Algarve; particularly during the summer when it is virtually impossible to phone; it must be remarked that these fax and telephone constrains can stimulate the adoption and use of X25 connections the same way as they are stimulating the adoption and use of mobile telephony.

In Northern Europe

There is no technical barrier in Northern Europe that could hinder the adoption and use of advanced communications connecting tour operators with both agencies and hotels, these located in the touristic areas. Even to develop the second solution, through which the access to the booking information system starts at the household it is likely that in the near future all the families that could afford holidays abroad could also be connected to internet, compuserve or micorsoft network.

**Economic Barriers**

Connections with remote areas:

Local areas are relatively small in Portugal and some touristic resorts are not in the same area as the X25 connections. Therefore they must pay an interregional call to access the node which can be quite expensive for a small entity. For example the costs of TURHAB - referred above - will tend to be higher by each operation performed than the the same costs related with the connection with different hotels in the Lisbon area - planned for the Utel network - also referred above.

Connections with the Portuguese traditional touristic areas

The connection between hotels in Portugal and tour operators abroad will become cheaper due to tariff rebalancing. Based on the existing structure of the touristic value
chain (Figure 2) this will increase the profitability of tour operators located outside Portugal.

Sociological Barriers

According to the State Secretary for Tourism - Dr. Alexandre Relvas - there is not a sufficient knowledge of the capabilities of advanced communications for tourism development.

Most of touristic companies have internal management problems associated with the lack of capacity to deal with information and most of the times, with lack of dimension; therefore it seems wiser to secure internal informatization before connecting with the outside.

There is enough capacity in Portugal to diffuse and adapt advanced communications to the touristic sector. What is missing is the definition of the sector needs by the sector itself and also some openness from big telecommunication operators - like Telecom Portugal - to facilitate the participation of private providers of telecommunication services that need the collaboration of those big operators.

5) How to move forward?

From the previous section it is clear that the main constrains to the diffusion and use of information technologies by the touristic value chains are sociological and - in more remote areas - also technological and economic. To overcome some of these barriers there is a set of advisable political measures

a) It is crucial to support pilot projects that, through the use of advanced communications, could develop the integration between similar hotel chains. The initiative of TURHAB and the other involving thermal resorts can give important demonstration effects.

b) It seems more important to support the expansion of regional operators abroad then to concentrate all the Portuguese tour agencies in just one big network, as it is proposed in the SMEs initiative. The support given to the former one will be lower and the subsidy applied to the second initiative will hinder the development of independent initiatives and will reduce the competition between Portuguese operators.

c) Beyond that, it is important to avoid first and second division in the access to internet, and other telecommunication services; and this concerns price, reliability and speed. Actually, it was shown that unless the more remote resorts can have access to these services, they will be forced to have an intermediary or be completely out of the system.
III

Phase 2: Strategic Options for the Information Society

PORTUGAL

Footwear

Portfolio

DESCRIPTION

During the eighties, the production of footwear continued its move from developed countries to developing ones, mainly located in Asia. China is the main producer but the main exporters are Taiwan and South Corea. Nevertheless other countries like the Philippines, Marroco - with close links with France - and Dominican Republic - associated with the United States - could also become important exporters in the near future. In all, footwear is a rather footloose and labour intensive industry.

The Portuguese footwear industry tries to survive in this rather competitive environment. It involves around 1100 companies with 55000 workers. Total production increased from 65 million pairs in 1986 to 109 in 1992, from which 78% are exports. Nevertheless this expansion was based on a strategy of reduced wages which limits become clear in the early nineties with the relative evaluation of the Portuguese currency; with reduced productivity (half than in France), difficult relations with suppliers of raw materials, unsufficient product differenciation (market prices 75% of the German and Italian shoes), and unknown market reactions (most of the companies sell to agents and distributors) it has been difficult to sustain the sector, chiefly without the traditional policy of currency devaluation.

RATIONALE AND HYPOTHESIS

To respond to this new challenge Portuguese companies are pursuing restructuring strategies most of them strongly supported by information and communication technologies.

First, from a system of subcontracting to small firms in the neighbourhood, large exporters are shifting the more labour intensive part of production (sewing) to third world countries like Cabo Verde where wages are 25% of those verified in Portugal. Although the quality of communications with those countries is bad and expensive, such movement would be impossible without the support of, at least, one fax machine and one telephone.

Second, there is an increasing vertical integration of the footwear value chain, either upwards with the leather producers, or downwards with distributors. Information technologies are certainly needed to support the logistics of these integrated value chains; nevertheless, the information
technologies that support these transformations are not very sophisticated. Once more only faxes and telephones seem to be needed.

The information systems which are being strongly pervaded with information technologies are design, with modern CAD tools, internal management, with improved decision support systems; and even Computer Integrated Manufacturing systems for automatic production lines.

The results of these restructuring movements in the footwear industry, somehow supported by information technologies, are rather obscure and a few questions need to be answered:

a) Will the diffusion of information technologies, which nowadays occurs mainly indoors, will reach subcontractors abroad and customers in the core regions?

b) Can the Portuguese footwear industry compete either with the logistics and design of the footwear industry in Italy and Germany, or with the labour cost of Taiwan, Corea and China?

**Case Study**

1) **Characterisation of the Sector**

Figure 1: The Spatial Structure of the Portuguese Footwear Value Chain

Besides the relative success of the Portuguese footwear industry the connections with the Portuguese leather industries are very weak. Leather comes mainly from Argentine and Italy which firms secure better quality and faster answers; the design is frequently a copy of Italian shoes and there are no independent designers like in Spain; most of the distribution is also controlled by European companies.
2) Actual Information Systems of the Portuguese Footwear Value Chains.

Figure 2 presents the more important information and technological structures of the footwear value added chains. The image is useful to explain the footwear value chain information systems which are organised according to the activities of the value added chain: tanning, cutting, swing, assembling, sales, distribution and design.

The tanning decisions are closely associated with the orders by the footwear industry and other industry that utilise leather. This communication - usually done by paper, fax and telephone - links the footwear producer in Portugal with the leather producer in Argentine and Italy. As said before there is tanning industry in Portugal but the connection with the footwear sector are not strong.

Figure 2: Structures and Flows of the Footwear Value Chain

At the strict level of the footwear industry there are various interconnected information decision structures which have direct consequences upwards and downwards the value chain:

- The Purchasing Policy. The usual purchases of leader by the Portuguese footwear industry is done for large series of production and, therefore, the information intensity by unit of leather is normally quite low; paper, telephone and fax is the common medium at this stage of the value chain. The operation of a store for raw materials in a plant to produce 1000 pair of shoes per day is guaranteed by 2 employees.

- The Cutting stage involve 10 employees for a production of 1000 pair of shoes a day. The cutting activity is very important since the cost of leather for a pair of shoes is 20 times higher than the cost of labour involved in cutting. Traditionally the functions involved in cutting are to analyse, display and cut the leader. This functions are very much information intensive and, since leather is quite irregular, they are usually best performed by man.

- Sewing is a labour intensive activity. With a sewing time of 20 min/pair of shoes the number of employees needed to produce 1000 pairs a day is about 40. Beyond the
information imbedded in sweing, processed by man, there is the information related with labour productivity usually stored and transmitted by paper.

- Assembling and Refinement are the last stages of the production process. For 1000 pair of shoes a day these stages require 10 employees for assembling and 6 for refinement. These stages involve some machinery and it is its productivity that is of major interest for the management of the factory. Nevertheless, the complementarity with labour is also very important and it is traditionally the man and paper the main channels of information at this stage of the value chain.

- The management of production - including cutting, sweing and assembling - require 9 employees for 1000 pair of shoes per day, to control the productivity and quality of the system, to monitor the inventory level and also to maintain the equipment. Man, paper and also telephone - between the different sections of the factory - are the main carriers of the information related with those tasks. When the same company control different factories there is also a wider use of fax and, although sometimes an email system be already in place, its use is not routinised.

- The design is a crucial task in the footwear industry and, for a production line of 1000 pairs a day, it needs usually three employees and a more or less complicated CAD / CAM system. Traditionally this section is integrated inside the footwear industry; it receives market information from the sales department and ideas from other sources, and it delivers paper orders and moulds for the cutting, sewing and assembling stages.

- The Sales section receives - from the production - information about the level of inventories and - from the distributors - the demand for products and respective market prices. The Sales section than send information to the production management section and, considering the reduced degrees of freedom left by the distributors and retailers, takes decisions related to sales conditions, advertising, choice of alternative customers and the timing of sales. Related with Sales there is a current use of paper, fax and telephone.

The communication between the distributors - located in the North of Europe - and the customers - for example Marks and Spencer in the UK or - is based on paper (sent by mail), telephone and fax. Yet there are good conditions to introduce EDI systems to reduce the transaction costs between these two types of economic actors.

3) Potential Information Systems of the Portuguese Footwear Value Chains.

There is a strong competition in the footwear industry all over the world. In Italy the industry has very good linkages with the leather suppliers and has very elaborated designs. In Spain, France, Germany and the UK - arguably because there were stronger investments in equipments in the past - labour productivity is considerably higher than in Portugal [Portugal: 2200 pairs per worker; France: 4370]; there is as better product differentiation and a superior knowledge of the market. Against other emerging economies like Korea, Taiwan and China the cost of Portuguese labour force is higher.

According to some studies and reports about the Portuguese footwear industry, to compete in the world market the Portuguese industry must adopt a strategy leading to faster response to the customers, to improved market knowledge and to higher product differentiation.
Faster responses to the market allow bigger volumes of orders, lower markdowns, higher circulation of inventories and higher prices; eventually more 15%. Improved market knowledge is relatively easy to obtain since there are good business relations with the customers in the North of Europe and, due to the Portuguese integration in the European Union there is an increasing common knowledge about production methods and norms. Finally, higher product differentiation is the logical outcome of faster responses with improved knowledge of the market.

To undertake this new strategy, involving shorter production series and increased flexibility, there is among these particular group of medium size firms a greater awareness for the adoption of new forms of organization. Many firms are planning to restructure themselves through the intensive use of information and communication technologies [CAD/CAM systems; distribution systems; working teams; management information systems; and, quality monitoring systems] and with a significantly different spatial distribution of activities.

There is as well the strategy to reduce labour costs. Until now, when big order could not be delivered on time, it has been possible to outsource some sewing activity to small and flexible firms located near by the main factory, in garages or fast stores. Due to the rise in labour costs and the support from international funds, some footwear companies are displacing the cutting and sewing production stages to Cabo Verde. Notice that the cost of a pair of shoes (type Richelieu) is more or less fixed in terms of raw materials, energy and capital (12 US $) but varies considerably with the labour costs: it is 13 US$ if everything is produced in a developing country; 15US$ with cutting and sewing done in a developing country but assembling and refinement undertaken in a developed country; and 23 US$ if everything is produced in a developed country.

The geographical image of these strategies (Figure 3) is significantly different from the previous one (Figure 1). First, an improved market knowledge is associated with the shift from the copying activity of the Italian series to a closer dialogue, in terms of design, with the Northern European distributors which then are able to sell the Portuguese shoes, with their design and brand names, to America and Japan. Second, faster responses to the market imply an improved interconnection with the tanning companies, if possible located near by in Alcanena (Portugal). Third, to seek reduced labour costs involves the outsourcing of cutting and sewing activities to African countries, preferably speaking the same language to facilitate coordination. Finally, the challenge of the new competition stimulates merging processes between various Portuguese footwear companies.

In a way, the geographical image of the footwear value chain will depend on the strength of two opposite movements, both of them highly associated with the diffusion of information and communication technologies. On the one hand, improved information systems allows a better coordination between design, tanning, cutting, sewing, and assembling and - profiting from better market knowledge and greater access - there is a pressure towards vertical integration, potentially keeping most of the processing functions close to each other (delivery times from Brasil is three months, including five weeks for transport and its just ten days in the United States). On the other hand, better information systems, improved transports and increased competition is stimulating the vertical desintegration of the processing stages, locating
each function in the place where it is performed with reduced cost. The most likely result of these two opposite pressures will be a rather flexible system where the labour intensive stages - like sewing - can be requested from one place or another according to the nature of the demand;[before the outsourcing was done to places near by the main factory; from now on, with better communications, the outsourcing can be done to much far away].

Figure 3: The New Spatial Structure of the Portuguese Footwear Value Chain

Apart from the big market chains - which will continue to establish orders, prices and other conditions to their suppliers - the distribution of control along the Portuguese footwear value chain is still quite unclear and possibly, even for big production lines, various structures will survive. The distributor [ECHO from Denmark] with a brand name can control the processor in Portugal but, another Portuguese processor [Growela] can also establish a joint venture with the UK distributor [Lambert and Howard] or just reinforce the control over its own agent [NeeBee]. Upwards the value chain the producer [Growela] can have a branch plant in Cabo Verde but can also keep all the processing phases in-house. Finally, it is conceivable that some footwear industry in Portugal will try to control the national tanning sector reinforcing the Portuguese footwear cluster.

The functions, decisions and information flows of these different production systems are similar to those presented before in Figure 2. Due to the spatial flexibility of the production processes there are, nevertheless, remarkable differences in the structure of information and communication technologies. There will be also various software designs according to the distribution of control along the value chains but we will not focus these particularities in this case study.

Figure 4 presents the type of information and communication technologies that could be adopted and use along the footwear value chains. From a recent report about new production and organization technologies for the footwear industry, it is possible to identify the potential improvements on the previous situation:
- First, it is advisable that the information system attached to the purchasing orders of leather could allow a better coordination between the two actors. The aim is to provide, on time, the ability of leather to the request of the final consumer. The minimum requirement is a system based on the emulation of terminal through which it will be possible to create a frequent dialogue between the leather supplier and the footwear industry concerning orders, prices, qualities and conditions.

- Second, in a competitive footwear industry the design of the models have to be done by CAD / CAM systems. This involves various phases: leaflet preparation, creation of the basic model, engineering of the basic model for different sizes, optimization of the market prices, elaboration of prototypes, preparation of the machinery, optimization of the disposition of the cutting tools and preparation of the orders for the different production phases. The design by CAD / CAM is also important to define the area and shape of the pieces, the materials requirements, the estimation of labour times (cutting, sewing and assembling) and the design of the tools needed for the production. Because most of the design activity will be detached from the processing phases - in independent companies or near the distributor - there must be a support of information and communication technologies able to carry that information between the different actors of the value chain (customers, suppliers, cutters, sewers, assemblers and footwear managers). Specifically with customers it can be very useful the use of multimedia systems which would allow the direct visualisation and correction of the final product.

Figure 4: Potential Use of Information and Communication Technologies.

- Third, as said before the cutting activity is very important since the cost of leather is considerably important. The system of cutting on water jact tables is more flexible and can save 10 to 14% of leather (in Portugal 5 to 7% the cost of a pair of shoes). There are Portuguese firms that already use this technology: KYAIA, BASILIU, SOCOBEC / Sapatarias Teresinha; JORFAC. Yet, the crucial point in terms of telecommunication is that there must be an interface with the CAD system. There are also expectable improvements in the identification of leather defects based on ICT
system; if so it would be possible to increase the integration between design and cutting and to save labour.

- Sewing is a labour intensive activity. Although it is possible to envisage the creation of machines for automatic cutting integrated with the CAD system, the common and already tested introduction of information technologies into this production stage concerns semiautomantic machines. Furthermore there is automatic distribution of cutting; The aims of this system are: to increase the flexibility of the cutting section and allow the simultaneous management of the production of various models of shoes.;- to maximize the use of the labour force available; - and to control, on real time, all the cutting section.

- Assembling and Refinement are the last stages of the production process. These stages involve some machinery which need to be prepared for each serie of shoes and the preparation takes some time of the machine. It is, then, very important to optimize the scheduling of assembling of the various series according to the machines available, the delivery times requested and the outcomes of the sewing section.

- The management of production must be closely integrated with other management modules: purchases and suppliers, materials, financial, labour and commercial. The optical identification of the products is very useful to control the process along the production chain.

- Regarding the communication with the distributors located in the North of Europe, there are good conditions to introduce EDI systems to reduce the transaction costs between these two types of economic actors. Actually there is a movement to reinforce the connection downwards the value chain with joint ventures and merging processes.

- Finally, it is common to have many plants of the same company spread along a considerable large area. Growela for instance has three plants: one in Maia, other in Lousada (30 Km away) and a third one in Guimarães (at a distance of 50 km). To integrate management it is crucial that the management information system adopted by each company could connect the different plants.

3) Potential ICT’s systems for the Portuguese Footwear Value Added Chains.

Following the value added chain there are five main links that can be pervaded with ICT systems: one connects the designers - in Europe or in Lisbon - with the processing plants in the North of Portugal; the other links the branch plants for cutting and sewing activities in Cabo Verde, with the processing plants in Portugal; another connects the leather producers in Portugal and Europe with the processing plants; another one joins the distributors headquarters with the processors; a final one connects various plants of the same company.

Let us look at each one of these connections trying to analyse, in the next section, issues like accessibility and affordability, which will feed the final report about the Strategic Options for the Information Society.

a) Designers - in Europe or in Lisbon - with the Processing Plants

The easiest way of sharing information (drawings, orders, invoices, etc.) between designers and plants is using electronic mail with these files as attachments. The main problem is although electronic mail doesn’t usually need high communication rates, in
this particular case the transferred files may be very long, leading to a high transfer
time. This problem can be partially overcome with the compression of the attached
files. The global solution is affordable, being a small investment compared with the
very sophisticated CAD-CAM solutions the designers already have. It is also
available, since in terms of communication infrastructures the only resources needed
are a link (synchronous or asynchronous) to a public electronic mail server.

b) Branch plants in Cabo Verde, with the Processing Plants in Portugal.

African countries don’t usually have good telecommunication infrastructures, so there
may be some problems in terms of availability. Affordability may also be a problem
for the branch plants unless the solution is very simple and economic. An economic
solution can be an asynchronous connection to a electronic mail server in Cabo Verde.
If that solution is not possible, the connection to a Portuguese electronic mail server
will be much more expensive, so it is important to evaluate several alternative
solutions, including VSAT connection, usage of local infrastructures or maintenance
of paper-based information.

c) Leather Producers with the Processing Plants.

Electronic mail can be the privileged way of communication between producers and
the plant. EDI is also a good solution, mainly for the factory point of view, because
the advantage of the introduction of EDI is becoming apparent when the number of
automated transfer processes reaches a certain amount. In terms of affordability, the
increase of usage of EDI and electronic mail for different processes and to
communicate with different entities, leads to a smaller investment per entity/process.
In terms of availability, it’s important to assure the existence of infrastructures in the
leather producers own countries. The natural evolution will be from simple electronic
mail to EDI (connection to a clear centre), with an intermediate phase where EDI
messages are passed as attachments of electronic mail.

d) Distributors in Europe with Processing Plants in Portugal

The EDI connection between plants and distribution doesn’t present any constraints in
terms of affordability or availability.

e) Between plants in Portugal

Since the plants will need to have connections to a X25 public network, and will use
EDI and electronic mail with their partners, they do not need an extra investment to
connect between them. This connection will have virtually no cost if they use the
infrastructures they already have. They can instead use a high speed link between
them if they need to share resources like files or printers, but the cost will be higher
and probably the cost/benefit ratio will be lower than the other solution.

The costs associated with this solution are as follows:

- For the plant it is necessary to have a X25 board and associated software which cost,
  for small machines can be around 1000 ECU. A synchronous connection for 19200
  baud with 8 SVC costs monthly around 310 ECU, including the modem.

The minimum requirements to implement an EDI system is a personal computer. The
function of that computer is to receive, process and transmit messages and it must
have a specific software to perform those functions. This software costs about 2000 ECUs.

It is also possible to base the EDI system on a UNIX or AS400 and to install the EDI software in that equipment, saving the cost of an extra personal computer. Yet, in this case the cost of software specific to EDI is higher. The EDI software for a UNIX or AS400 system can go from 3750 ECUs to 15000 ECUs according to the equipment.

Figure 5: Communication System between the Footwear Processor with the other actors of the Value Chain.

To implement an EDI system it is also needed to define a mailbox in a clearing centre for EDI. Messages are invoiced through this mailbox to the different partners of the EDI system. Monthly, the EDI mailbox cost is around 12 ECUs more expenditure on traffic.

An X400 electronic mailbox costs around 7 ECU plus traffic. Usually the machine used for EDI can also be used to access the mailbox.

- At the branch plant there must be a personal computer - which costs less than 1000 ECUs - and an asynchronous modem at 9600 baud - which lower cost is 125 ECUs. The monthly asynchronous connection rate is about 15 ECUs for a 9600 baud connection, but these are Portuguese prices.

It's also needed a mailbox in a electronic mail server. As already said, it costs in Portugal about 7 ECU per month plus traffic.

- Designers, leather producers and distributors can have solutions of different complexity according to their needs.

Assuming they already have a machine, they can have an asynchronous connection (125 ECUs for the modem and 15 ECUs per month plus traffic) or a synchronous one (at least 1000 ECUs for the X25 board and 310 ECUs per month plus traffic).
When they are connected to a email mailbox, the cost will be 7 ECU's per month plus traffic.

When they use an EDI service they will need the software (2000 to 15000 ECU's) and the mailbox (12 ECU's per month plus traffic).

4) Barriers and Prerequisites.

There are technical, economic and sociological barriers that hinders the development of these new systems.

Technical Barriers

In Developing Countries:

The telecommunication connections between Portugal and developing countries and within developing countries, like Cabo Verde, are unreliable, expensive and quite slow. Therefore it would be difficult, under the present circumstances, to introduce integrated systems between Portugal and Cabo Verde. Even telephone and fax are often difficult and expensive to operate.

In the Portuguese Footwear Spatial Clusters

At the processing stage - in the footwear spatial clusters in Portugal - there must be telecommunications infrastructures which support X25 connections, not only to guarantee the connection with customers and designers in developed countries - and, eventually, suppliers in Portugal and Italy - but also to integrate different plants of the same company within Portugal. There is already availability in all territory from both public X25 operators.

In Developed Countries

At the distribution stage - in the North of Europe - there must be telecommunications infrastructures able to connect with the Portuguese companies.

Economic Barriers

Developing Countries - Portugal

Between non-European countries and Portugal it is not imposed a rebalancing of tariffs. Therefore the barrier created by the high tariffs with Cabo Verde may not decrease in absolute terms and thus will increase in relative terms.

Portugal - Portugal

The connection between the processing plants within the footwear spatial clusters in Portugal is not much influenced by the rebalancing of tariffs, since most of the communications will be synchronous connections at a fixed rate, but the cost of the asynchronous connections is still dependent of the distance to the nearest communication node, and will be aggravated in the less developed regions.

Portugal - Developed Countries

The same happens in the connection to be installed between the processors in Portugal and the distributors abroad, although the costs will be higher.

Sociological Barriers

Developing Countries
The ability of developing countries to attract inwards investment is their reduced cost of labour which is very useful when the tasks to be performed are undifferentiated, relatively independent of logistics and do not require much skills. Whenever there is another place with lower labour costs or the process can be partially or totally automated, then the advantage of the developing country vanishes rapidly.

The features associated with the advantages of developing countries to attract inward investment are the same that impede the adoption and use of advanced communications. Without particular skills it is impossible to use ICT effectively; without the pressure of logistics those technologies are not necessary. In other words when some type of cutting and sewing move to a developing country the information requirements of those activities are simplified and the demand to adopt and use sophisticated information technologies also decreases.

However, in the case of Cabo Verde there are some skills and, if the footwear industries would like to create the logistical pressure, the barriers will be more technical and economic than sociological. Besides, beyond Europe and the United States, Africa can be an important market for a small but nearby producer like Cabo Verde.

Portugal

In Portugal there are some difficulties regarding the adoption and use of advanced communications:

- There is an environment of distrust between different companies which does not help the co-operation between them to develop information and communication technologies that could be used effectively by all. That same environment also persists between the Portuguese footwear industry and the Portuguese tanning companies which hinders the co-operation towards obtaining faster responses to the market, necessarily through an intensive use of advanced communications.

- Although some firms do use advanced communications the majority of them do not invest in those technologies either because there is not enough scale or because they live on sub contracts from major firms.

- Finally most of the firms are family owned which sometimes impedes the introduction of modern management techniques supported with ICT.

5) How to move forward?

From the previous section it is clear that the main constrains to the diffusion and use of information technologies by the footwear value chains are sociological and impressively Portuguese: lack of co-operation, family businesses;... Beyond that there are as well important barriers to the adoption and use of advanced communications in developing countries

Regarding Portugal:

a) It seems important to support independent designers associated with small firms who, through the use of CAD / CAM systems, can produce moulds and introduce fashion in small scale producers.
b) It is also crucial to support pilot studies that, through the use of advanced communications, could develop the integration between tanning and footwear companies.

c) The merging of different plants also require specific information technologies suitable to integrate the management of production chains located in different places within the same area of 40 Km diameter.

Regarding Cabo Verde:

There must be some attention in the support of investment in developing countries since the support is often the main reason to invest and long term perspectives are obscure. What seems interesting is a careful study of the cases in place with the identification of very specific barriers and related measures.
IV
Information Society and European Cohesion
Phase 2: Strategic Options for the Information Society
PORTUGAL
Health

Portfolio

DESCRIPTION

The health sector can be foreseen as a value chain where the main product is the patient being analysed and got better along the different stages of the chain: diagnosis, treatment and attendance. Like many other value chains where the "product" is a human being, most of the information is not only carried out by the patient himself but also constantly changing with the evolution of the patient' situation.

The patient enters the system through a consultation with the general practitioner at the local level. If the general practitioner can not solve the situation he send the patient to the specialist in the regional hospital jointly with a letter. The specialist can either solve the problem and, jointly with the practitioner, follow up the patient or, if not, he will send the case to the central hospital, supposedly with an information file about the case.

Nevertheless this system does not work, either because the health value chain is not appropriately managed namely the coordination between local centres and regional hospitals, or because it is purposely hindered by some doctors that want to transfer the patients to the private sector, not so much for expensive treatments that they can not supply but mainly to get a better diagnosis and to have common tests and analysis; part of these is indirectly paid by the national health system. In all the system only works reasonably well in extreme cases and through the urgency, naturally congested by less urgent patients.

RATIONALE AND HYPOTHESIS

The introduction of information and communication technologies in this type of information system is not straightforward. First, there are some constraints related with the payment procedures either between the private and the public sector or between the different levels of the public sector; with all these barriers - that must be often overcome case by case - it is useless to speed up the transmission of information related with the patient. Second, some information related with the diagnosis can only be retrieved from the patient himself, and only without any other solution, has can occur in inaccessible places, schemes based on image and sound seem to be really useful. Third, there are information procedures concerning the attendance stage of the health value chain where information and communication technologies can be quite helpful. Actually, once information is standardised in routine analysis and treatments there is no need for the physical transference of the patient, who can then be just accompanied by the local practitioner but carefully controlled by the specialist located in the regional or central hospital; with well defined data, the specialist can keep the records of his patients in a rich and useful format; another problem is how these data
can be transferred to some central record about the patient, suitable to be used by other specialists and by the general practitioners.

The interesting problem is the way the organisation of the health value chain can change with these pervading technologies. Will the private sector continue to hinder the public value chain with a better structuring of the information between local, regional and central hospitals? Will there be a better management and reduced costs with the implementation of such system? Will the private sector manage to organise similar systems with reduced costs?

**Case Study**

1) **Characterisation of the Sector**

The Portuguese health sector is - from the Portuguese public sectors - an appropriate choice for this study because - due to financial problems common to most of the other health systems around the world - it is experiencing a strong pressure for rationalisation and the adoption and use of advanced communications present some important tools for that difficult task.

The public health system in Portugal has in the mainland 18 Regional Health Areas with 346 health centres (128 with internal patients) and their extensions; as stressed by a doctor we interviewed there is not enough health centres to cover all the population. Each Regional Health Area has at least one regional hospital and Lisbon, Coimbra and Porto have University Hospitals (2 in Lisbon and 2 in Porto) and quite a few hospitals for particular clinical specialities. In the Azores Islands there are 3 regional hospitals and 16 health centres with their extensions. In Madeira Island there is 1 regional hospital and 11 health centres and respective local branches. The islands are ruled by autonomous governments which manage the health system in each one of the archipelagos but with strong clinical relations with the Lisbon central hospitals to secure the treatment of more complicated clinical cases.

From Figure 1 gives an idea about the spatial structure of the public health system in Portugal. For example, the zone around the town of Chaves belongs to the Regional Health Area of Vila Real, in the North of the country. The zone around Chaves has 87000 inhabitants for one regional hospital and five health centres; two of them located in the main town and three in nearby municipalities around Chaves. Furthermore, each one of these health centres has extensions in small villages: Boticas has 3 extensions, Montalegre 10 and Valpaços 7.

The health system works theoretically like this: each team - composed by a family doctor, a nurse and an administrative - must secure the primary health care of 1500 persons. The services they provide are mainly vaccination, maternity, infancy supervision and adult health care. Nevertheless, most of these family doctors are distrusted by the families who saw them as the worse students of the medical schools; this, associated with the lack of basic equipment and support at the local level, creates a first barrier for the performance of the health value added chain. Furthermore, when the health centre is closer to a major town, if often happens that, either pushed by the family doctor or attracted by a better service, the patient is guided out of the public value chain into the private medical network chiefly for analysis and treatments that
do not involve much equipment. Noticed that, in Portugal, a great part of the private health care is indirectly paid by the National Health Service.

Figure 1: The Spatial Structure of the Portuguese Health Value Chains

For the secondary treatment and technical support to the diagnosis, the patient goes to the Regional Hospital of the zone. At this stage there are usually two barriers that a better information system could eventually solve. One is the lack of administrative coordination between the Health Centres and the Regional Hospitals which leads to the implementation of two non-related patient's data bases and to an all sort of management and financial problems. The other barrier is the lack of confidence that usually exists between the medical team in the Regional Hospital and the family doctor in the health centres which spoils the information exchanged between them.

There are a few schemes that - although relatively expensive - are able secure the reliability of the health value added chain in Portugal. First, the patient is the main carrier of information and, even without a good information system, it is usually possible to take new analysis and to undertake similar clinical enquiries. Second, the urgency services in the regional hospitals are always open and any patient can use it to enter in the health value added chain; it is asserted by many doctors that 80% to 90% of the cases treated in urgency services are false urgencies. Third, as stressed before, there is the private health system - sometimes managed by traditional mercy corporations - which, besides being partially paid by the National Health System, still controls a considerable part of the health sector in Portugal. Finally, because health is a prime target of most societies, there is the direct and indirect support for the health value added chain: the army supplies "free" transport by helicopter in the Islands; charity schemes got many funds to support associative hospitals; and family and community solidarity sustains some type of special treatments abroad.
Actual Information Systems of the Portuguese Health Value Chain.

Figure 2 presents the more important structures of the Health value added chains. The image - based in a few paper on health information systems in Portugal and clarified by some interviews - is useful to explain a set of interesting things related with the health value chain information systems. These chained information systems can be divided into two main sets of structures: the ones that deal with the interfaces between the various entities along the chain; and the others which focus the internal information systems of the main actors, health centres and hospitals.

Concerning the interfaces between the various entities of the health value chain the main characteristics are:

- The connection between the base of the health centres and their extensions in small villages and also between different health centres, if the patient moves from one to another. The information exchanged in these interfaces relates mainly with data about the patients but often there is a duplication of the records whenever the patient goes to a different health centre or even to a different extension of the same centre. The support of that information is paper or just the patient himself.

- The link between the health centres and the support regional hospital constitute the second interface. The main information flows concern booking for specialist observation or analysis, warning of urgencies and data on patients, both related with diagnosis (health centre -> hospital) and assistance (hospital -> health centre). The lack of coordination between the two levels creates some problems in this interface: first, data on patients is not often misleading and booking for specialist observation do not avoid big queues and related inconveniences for the patients. Once more the information carrier in this interface is paper - sometimes sent also by fax - and the patient.

- The interface between the different services inside each hospital and between regional and central hospitals is also quite important and even more complex not only because, at that level, the personal knowledge of the patient is lost, but also because there is a significantly different language between the various specialities. Patients usually do not complain much about the system but insiders do know that a lot must be done, and a lot can be done with the use of better information systems.

- Another important interface is with the patient itself and the relevant data he carries with his story and with his own files. Until now most of the information concerning each patient is within his own body and/or in data stored by himself. Private doctors and specialists also store specific information about their own patients, but this information is not shared by others. In all, there is not any information system to access data about the patients in Portugal.

- Finally, although not explicit in Figure 2, there is the interface that connects each entity of the health value chain with the National Health Service, the main 9 Because there is no coordination between the different health centres and the population accesses different health centres giving false addresses, it is quite common in some Regional Health Areas (see map) to have more users of the health system than inhabitants.
sponsor of the Health System in Portugal. Until now the health centres are paid not according to what they do but to what they do theoretically and the same happens with the hospitals. Due to that the management of the all system becomes quite difficult and the relation between health costs and health benefits deteriorates. Once more the use of advanced communication system has the capabilities to ameliorate that situation.

Figure 2: Structures and Flows of the Health Value Chain

The features of the internal information systems of the main actors (health centres and hospitals).

- For hospitals the information system that deals directly with the patients can be divided into four blocks: a) identification, where the patient is identified and related with a sponsor (National Health Service; the Health Care for Public Servants; other Private system; or some insurance company); b) consulting, where the scheduling and follow up of specialists' advises is defined; c) internal treatment, include all the information related with the clinical, logistic and administrative procedures related with the patients put in the hospital; d) and, urgency, which collects all the identification data of the patient for those who were not before in the hospital.

- For health centre the information system secures only the two first modules above: a) identification; b) and, consulting.

Notice that public health information systems are not the same all over Portugal. The various Regional Health Areas (see Figure 2) have important differences between each other although all of them, except Beja (in the South) do send the required information to the central services in Lisbon. In some Regional Health Areas the processing of
information is completely manual whereas in others there is a broad use of informatic systems; in some places files registered by the Health Centres are centralised in the respective Area whereas in others it is completely decentralised in the Health Centres; finally, there are situations where the coordination of the information systems is made by the clinical boards and others where that coordination is controlled by the administration.

Generally the information systems of each Regional Health Area are build up on a bottom up approach, chiefly designed to support sectors like statistics and planning in the Regional Health Area and in the central administrative services in Lisbon. The reliability of that system is not high because the motivation of the information providers is not remarkable; besides what is the use of providing information that enhances the control of the Health authority without any feedback.

The adoption and use of information technologies is also quite different from one site to the other. Porto, Lisboa, Aveiro, and Santarém have created their own informatic teams and produce their own software, eventually with the support of private companies. Braga, Coimbra, Évora and Beja demand informatic services from SIMS (Informatic Services of the Health Ministry). Nevertheless the applications developed by SIMS are designed aiming the integration of the various places and systems and there are many delays in the implementation of those applications.

A data base to support the management of patients is the main priority for all the Regional Health Areas although that problem is bigger in urban areas where each patient is virtually unknown. Concerning the management of clinical data there are very good programs but, because they are designed for specialists, they required a considerable adaptation of the family doctor in the Health Centres and they do not provide the necessary data to be produced at the level of the Health Centre.

From a survey undertaken for all the Regional Health Areas in 1992 it is evident that there is a broad use of informatic applications in the Portuguese Health Sector. However, centrally imposed applications related with the management of patients and health statistics (nurse acts, consulting, accommodations, urgencies) do prevail. Furthermore, apart from the strictly administrative applications (inventory control, accountancy and staff management) the list of main applications are: monitoring of pharmaceutical invoices, monitoring of diagnostic and therapy support resources; conventional medicine, water quality, vaccination control, oncologic registration, death registration. The operating system more used is MS-DOS in individual PC or internal networks and the software languages are Clipper (dominant), COBOL and C.

3) Potential Information Systems of the Portuguese Health Value Chains.

There is an increasing pressure to solve the problems related with the structure and functioning of the Health Value Chains in Portugal. The lack of funds and the poor quality of the system create permanent challenges and the development of advanced communications is giving new hopes and tools to face those challenges. From the previous sections there are two problems that are more evident: one is the inadequacy of the health value system to compete and co-operate with the private sector in the urban areas; the other is the coordination between the health centres and the regional hospitals.
From some reports produced by IGIF (Institute for Financial and Informatic Management of the Health Ministry) and from a few recent interviews given by the Health Minister in the press, there are two main sets of political projects designed to face the problems highlighted above: one is the creation of a medical record for each person and the privatisation of the management of some hospitals located in metropolitan areas; the other is the implementation of Regional Health Units with the support of advanced communication systems, to obtain a better coordination between regional hospitals and the health centres located in the respective zone.

- The Creation of the Medical Record and the Privatisation of Hospital Management

Medical record scheme is a systematic storage of information about patients, able to allow a diagnosis, suitable to justify a treatment, created to show the evolution of the patient and formulated to define the final outcome. This record is associated with the citizens' right to choose the doctor they like and with the obligation that every doctor has to produce a standardised record with all the pertinent information related with the health act he performs.

That Medical Record, if appropriately designed, has a great utility for an all sort of actions related with health: it satisfies the need of the patient in terms of treatment; it supports the family in its health care role; it supplies data to study epidemies; it is used to train health professionals; it informs legal contracts related with health care; it supports health planning and health resource management; it facilitates quality audits of the health system; and it provides information for research.

There are different ways to develop the Medical Record but, according to IGIF, the best way to do it is through the implementation of the Regional Card of the National Health Service; each person will have a card with a number which, being the same along the health value chain, will facilitate the collection of the information produced about a particular patient in each one of the chain's stages. Therefore, although each patient can be registered in the various data bases along the health value chain, there is an easy way to retrieve all the information related with him.

The system must obviously be designed to secure ethics and to control the quality and safety of the information. The concept of a Medical Record - and the citizens' rights associated with it - is very important when related with the privatisation of hospital management in the main metropolitan areas. Actually, the accessibility to the patient's record from one hospital to another will secure the people's freedom to choose the hospital they like, public of private, with private or public management. This ability, linked with an appropriate financing system, will stimulate the competition between the central hospitals and will arguably ameliorate their performance.

- The Implementation of Regional Health Units.

It must be stressed previously that the management of a simple regional hospital of a local health centre is so complicated that, each one of these entities must have their own information systems: SONHO is the project for hospitals and SINUS is the concept for health centres. Thus the idea of a Regional Health Unit does not correspond to an different entity but instead to a network of organisations through the use of telematics. The task is to create a process to follow the patient along the health value chain which can be reliable, simple and fast, namely through: a) the rational collection, processing and use of information securing its reliability, validity, security
and confidentiality; b) the integration of administrative procedures, reducing patients' waiting times and avoiding useless procedures; c) the accessibility to information by authorised health professionals; d) and, finally, the monitoring of indicators suitable to evaluate the performance and cost of the services provided.

Figure 3: The Proposed Spatial Structure of the Health Unit

The practical measures associated with these targets are: i) the implementation of a unique identification of the users in each Regional Health Unit; ii) the development of a system to communicate, in real time, between the Health Centres and the Regional Hospital in both directions; iii) the creation of automatic consultation booking either in the hospital or in the health centre; iv) the simplification of the access to the hospital; v) the allowance of automatic access to the information about a patient in the health centre and in the hospital urgency; vi) the possibility to add to the system any reliable and useful information produced along the medical acts; vii) the communication of death and births; viii) the access by the private health sector to the information stored; and ix) and the automatic transference of the record if the patient migrates to another area.

The system is composed by four modules. The information system for Health Centres, called SINUS, and the Management System for Hospital Patients, named SONHO, both presented in page 4 above as the "internal information systems of the main actors". The other two are, first, a Communication System between SINUS and SONHO and, second, a system to produce health indicators targeted to the health planning board in Lisbon.

The spatial structure of those new chains will tend to be completely different from the previous ones (figure 3), with more coordination between the different levels of the health value chain and to a bigger competition between central hospitals - either private or public. It is too early to perceive the global effects to these policies but what
is possible to envisage is that, due to the constraints and prerequisites for the adoption and use of advanced communications, the foreseen model will not be the same all over the country.

The functions, decisions and information flows of these restructured health value chains varies a little from those presented before. There are, nevertheless, remarkable differences in the adoption and use of information technologies, in the location of control and in the competitive environment in the health sector; a patient can change between one central hospital to another in the same metropolitan area and the hospital with less patients will be penalised; otherwise, in the rural areas, a patient can also move from one family doctor to another and the former will be received less payment.

There is also a new environment around the private health system. On the one hand, the new financial system will diminish the differences between private and public hospital in the metropolitan areas. On the other hand, the use of new information technologies will expand the area of influence of the private specialists; in the end they will be able to compete with the public health system also in peripheral areas.

Figure 4 presents the type of information and communication technologies that could be adopted and used along the restructured health chains. From the IGIF reports the potential improvements in telematics on the previous situation are in the Communications Module where a set of interfaces must be developed:

a)- One to support the connection between the site of the health centres and their extensions in small villages and also the link between different health centres. This interface is mainly to exchange information about the patients specially when they change from one place to another; it must be secured by telematic connections between the Health Centres and between each Health Centre and its extensions preferably with a system based on terminal emulations.

b)- Another to guarantee the link between the health centres and respective regional hospitals. The patients' follow up between the two nodes (consultation booking and medical reports), the search of data in the various data bases and the introduction of new data in those data bases are the main information tasks to be performed in this link. The telematic system suitable to undertake these tasks must be an integrated system established between the Health Centres and the respective Regional Hospital.

c)- The interface between the different services inside each hospital and between local, regional and central hospitals is also quite important. These type of system is crucial for the follow up of the patient: either, up the Value Chain for more specialised diagnosis and treatment, or down the Value Chain for information concerning the patient's assistance. In this case an integrated network must involve the Central Hospitals, for the various specialities, the Regional Hospitals and the Health Centres. According to an hospital manager we interviewed this system can also be very useful to inbound logistic because it will allow the common knowledge of the prices and conditions of the services provided by the hospital suppliers.

d)- Another important interface is between the health system and the patient itself and the relevant data he carries with his story and with his own files. The access can be guaranteed through the Extension of the Health Centre - by a
3) Potential ICT systems for the Portuguese Health Value Added Chains.

As we saw all these interfaces can be pervaded with ICT systems but, in terms of telematic connections, some of them overlap the others. The all system and respective costs can be presented as follows:

- For the various extensions of each Health Centre one simple PC connected to a public PAD via an asynchronous 9600 baud modem can be used. The PC costs less than 1000 ECU and the modem can cost 125 ECU or more. The monthly asynchronous connection rate is about 15 ECU for a 9600 baud connection.

- For the Health Centre the basic hardware and software to support the system is: A Unix System with 24 Mb RAM, 512Mb to 1 Gb Disk and backup unit (4000 ECU to 12500 ECU), one personal computer to use as a workstation (1000 ECU), one printer (1500 ECU) and an SGBD like ORACLE, INGRES or INFORMIX. It is also
needed internal telematic infrastructure (according to the physical installations), as well as an X25 board and software which cost can be around 1000 ECUs for a small UNIX system. The connection to a X25 public network with 2 SVCs costs around 250 ECUs.

- For the Regional and Central Hospitals, the infrastructure is about the same as the Health Centre. Probably they will use a bigger UNIX machine with more workstations and printers, an X25 line with more SVCs, and will run other type of applications in it, such as inventory control, accountancy and staff management. Some of the hospitals may already have UNIX machines with relational databases and communication infrastructures available, so they do not need to invest too much in these.

The following diagram represents the infrastructure needed for the connections named above.

**Figure 5: Telematic Infrastructure to Support the Health Value Added Chain**

![Diagram of Health Centre and Connections](image)

4) **Barriers and Prerequisites.**

There are technical, economic and sociological barriers that hinder the development of these new systems.

**Technical Barriers**

Rural level:

At the level of the Health Centre extension - in small villages - there must be telecommunications infrastructures with a minimum capacity of 9600 bauds. In many places there is not these facilities; hence the communication must be secured by letter or just by moving the processor of information to the nearer extension with enough telecommunications infrastructures.

Local Level

- At the Health Centre - in small municipalities - there must be telecommunications infrastructures with a enough capacity to support an X25 connection.
Metropolitan Level

- At the central hospitals - in the regional capitals and their suburbs - there must be telecommunications infrastructures able to connect with the local level. The X25 connection will need to be dimensioned to support all the hospital traffic, so it will probably be a high speed connection.

**Economic Barriers**

**Rural level - Local Level**

- The rebalancing of tariffs will increase the price of connections between the extensions of the Health Centres and the respective headquarters. This will hinder the financial performance of the Health extensions. Furthermore, the equipment cost - a modem and a computer - although not very high in absolute terms, can be quite high when related with the number of patients that belong to each extension.

**Local Level - Regional Level**

- The connection between the Health Centres and the Regional Hospitals is not much influenced by the rebalancing of tariffs, since most of the communications will be carried by an X25 system.

**Regional Level - Metropolitan Level**

- The same happens in the connection to be installed between the regional and the central hospitals.

**Sociological Barriers**

**Rural level:**

The system proposed will be quite simple to manage and the family doctor and his support staff will have enough ability to deal with it. Moreover, since the interface with the patient in the rural areas will always be a doctor - and not a computer - there will be no big changes in the interface doctor-patient.

**Local, Metropolitan and Sub-urban Levels**

At the other stages of the value added chain the barriers are bigger:

- First, there must be a profound change in the administrative procedures. The elimination of the traditional files of patients and their substitution for informatic files; the abolition of the manual fulfilment of forms and the introduction of automatic identification labels; the adoption of the user/patient card; the automation of bookings; the automatic production of statistics; and the follow up of the patient though telematic means.

- Second, there must be an enormous change in the joint functioning of the existing entities, from complete non co-ordination between Health Centres and Regional Hospitals to the creation of a new medium and a common language. This can only be achieved through an appropriate financing system of the various entities in the Health Value Chain and also through some enforcement and monitoring.

- Finally, in urban areas there is the barrier created by the private hospitals and clinics. Until now most of them received their customers directly from the public health
system without any special effort; as pointed by one doctor we interviewed, the actual system is hindered by private interests. After the implementation of this programme they will have to face a real competition, either from their colleagues, which will have access to the same informations facilitated by the patient and the public health system, or from the public value chain which will, supposedly, will perform a better job.

5) How to move forward?

From the previous section it is clear that the main constrains to the diffusion and use of information technologies by the health value chains are at the rural level, in terms of technical infrastructures, and in the urban area, in the case of sociological barriers. However, these barriers are not the same all over the country and certainly there are places and situations where good pilot projects can show the advantages and disadvantages of this proposed restructuring of the Health Value Added Chain.

There are two pilot projects that can be selected from this case study:

a) One refers to the implementation of an information system in a rural and remote regions where the private health system has a minimum influence, and where the close relationship between the family doctors in the health centres and the other doctors in the regional hospital could facilitate the adoption and use of the proposed system.

b) The other concerns the implementation of a network connecting one specialised central hospital - for instance a maternity - with the health centres located in the metropolitan area and with the private clinics. The aim is to share the information about the customers and to book special treatments in the best place whenever necessary.

All these systems are impossible to implement without the political will both to define a clear and intentional financial scheme to the public and private health systems, and to establish clear rules on the access and use of the information managed along the system. Obviously, a close monitoring of the programme to be implemented is also crucial to answer to particular problems not foreseen at planning stage.
CAP. 3

REGULAMENTAÇÃO DO SECTOR DAS TELECOMUNICAÇÕES
Study Assessing the Social and Economic Cohesion Aspects of the Development of an Information Society in Europe: Phase III - Part 2

For the 2nd part of phase III several interviews were conducted with representatives at the highest level of ICP (Instituto das Comunicações de Portugal, the regulating body in the Telecommunications field), CN (Comunicações Nacionais, a public holding which manages the State's interests in the communication companies) and lawyers of Portugal Telecom.

Introduction

The second part of Phase III was written using as a guideline the documents sent by the Core Group, namely the "Aide mémoire" produced by J. Cornford and A. Gillespie. This completes the first part in that it gives an assessment of the current legislation in relation to the liberalisation of telecommunications and the problems of social cohesion that it implies.

Several points were selected by us which are all concerned with liberalisation and its consequences on social cohesion and peripheral regions.

The first part relates to utilisation of the derogation period by the Portuguese Government and following this period the options chosen for full liberalisation.

Second part relates to ultraperipheral regions and the question of their access to the instruments of the information society. This problematic is linked to the definition and evolution of the concept of the Universal Service.

The role of the ICP and the intervention of the autonomous regions in this organ is then described.

Finally the telecommunications operator (PT) and its position vis-à-vis the demands of the universal service is referred to.

1º/ The question of the anticipation of liberalisation
Concerning the derogation accorded to Portugal by the Resolution of the Council n° 93/C 213/01 which permits Portugal to keep its public monopoly on fixed voice telephony, it is very difficult to say at the moment what its future utilisation will be. Only the Portuguese Government can decide on this issue, as it is essentially a political decision. This means that the ICP, as the National Regulatory Authority, and PT\(^{(10)}\), as the public service operator, have no influence whatsoever in this field.

At present it is very difficult to form an idea and a clear opinion on this future political decision, whether brought forward or not, because we are entering an electoral period. The centre right, presently in power, could lose the general elections to the socialists in October 1995 (a coalition government is also possible). For this reason it is unlikely that an official and definitive decision will be taken before the end of the year.

However, we can say that the question of bringing forward the liberalisation date is also determined by other elements.

Firstly, the situation in Portugal is connected to the situation in the other countries which also have the possibility of bringing forward the liberalisation date: if most of these countries bring forward liberalisation (as is the case of Spain and Ireland) it is unlikely that Portugal will adopt an isolated position, maintaining the public monopoly until 2003.

Secondly, a culture of competition has existed here since 1989, making the bringing forward of the liberalisation date much easier. The experience gained in the area of mobiles (mobile telephony, paging, trunking) is important from this point of view.

In our opinion, it is therefore probable that Portugal will bring forward the liberalisation of vocal telephony by two or three years. However, this is not definite as it depends on a purely political decision subject to various conditions. PT management has already asserted that liberalisation will become effective in the year 2000. Using the whole derogation period could have effects contrary to those expected and keep the telecommunications operator (PT) artificially out of the context of competition. For this reason we think that PT will do everything possible to prepare itself for liberalisation in the year 2000. In the PT manifesto concerning privatisation the year 2000 appears and most observers consider this date for liberalisation to be essential.

\(^{(10)}\) PT means Portugal Telecom. When we use PT we refer to the Portugal Telecom group including PT as the incumbent company in the telecommunications field, Marconi (affiliated company concessionary of the intercontinental calls), Telepac (affiliated company, provider of the PDSN service), TMN (affiliated company, provider of a mobile telephony service) and TV Cabo (affiliated company, provider of a TV cable service).
Two points can be made on the question of whether this liberalisation in Portugal can be brought forward in certain sub-sectors or with certain types of operators.

a/ In general, it is unlikely that the bringing forward of liberalisation will occur through the licensing of a non-specialist telecommunications operator, namely operators of electricity, railways or cable TV. The present orientation seems to favour the future authorisation of a specialist operator, entirely dedicated to telecommunications.

In addition, particular niches of the market should be opened up, even while public voice telephony is not liberalised. This is the case of the infrastructures for Telecommunication operators, authorized to provide certain services. Thus, these operators will be free to install, manage and commercialise the infrastructures they use. (However, nothing is likely to happen in this area before the year 2000). This is also the case with private networks and communications within closed group users, which could benefit from a bringing forward of liberalisation.

b/ We can surmise that any liberalisation brought forward for vocal telephony which is only partial would not be viable. This means that liberalisation which is geographically limited or limited to certain services only does not seem possible and does not form part of the government's plans for the future. For one thing, the obtainment of derogation until 2003 is based on the necessary unity and development of telecommunications from a geographical and therefore social point of view. Before the total liberalisation the market should be modernized and homogenized, so liberalisation of the costal strip and urban areas (which are the wealthiest regions in Portugal) would go against this logic.

The same logic applies to tariffs. Derogation until 2003 was awarded with the objective of Portugal preparing the rebalancing of its tariffs. These are higher than in the other European countries (local calls are less than their real cost and international and long distance calls are more than their real cost). However, for social reasons these tariffs will be slowly/gradually rebalanced to achieve a market prepared for liberalisation (this apply to fixed vocal telephony, since with leased lines the situation is evolving more rapidly). Derogation was awarded for this reason also: this year prices should have been increased from between 25% and 30% had it not been for social reasons. Over period of three years prices will increase 6% more than the inflation rate to effect tariff rebalancing (in the contrary the average weighted variation in prices of leased circuits for the years 1995, 1996 and 1997 shall not exceed zero, in nominal terms). This will affect in particular local calls and
subscription fees. The price convention between PT, Marconi (the international calls operator, which is a subsidiarity company of the PT group), the ICP and the Directorate General of Competition and Prices provides for this rebalancing. Portugal, like most other countries, has chosen the technique of the Price Cap instead of the Return of Investment (The US Congress has recently made the same choice).

It is important to note that there is an appendix to the Convention which provides "Service quality levels inherent in the Convention". This appendix establishes Service Quality Indicators (SQI) with Minimum acceptable values (Min), Target value (Tar) and Relative importance (RI) of each SQI, in order to verify the quality level of the Fixed Telephone Service in the the subscriber mode, to verify the performance level in the provision of the Fixed Telephone Service in the mode of public telephone boxes and to verify the quality level in the provision of the service of Circuits lease and in the provision of the service of lease of Interconnecting Circuit as follows:

<table>
<thead>
<tr>
<th>a/ Fixed Telephone Service, subscriber mode</th>
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<tbody>
<tr>
<td><strong>SQI 1 - Average delay in the installation of Telephone main lines (months)</strong></td>
</tr>
<tr>
<td>RI - 15%</td>
</tr>
<tr>
<td>1995 - Min 2.8 ; Tar 2.0</td>
</tr>
<tr>
<td>1996 - Min 2.4 ; Tar 1.6</td>
</tr>
<tr>
<td>1997 - Min 2.0 ; Tar 1.0</td>
</tr>
</tbody>
</table>

| **SQI 2 - Average Age of the waiting list to install telephone main lines (months)** |
| RI - 10%                                     |
| 1995 - Min 12 ; Tar 11                       |
| 1996 - Min 11 ; Tar 10                       |
| 1997 - Min 9 ; Tar 8                         |

| **SQI 3 - Percentage of irregular calls (%)** |
| RI - 15%                                     |
| 1995 - Min 3.0 ; Tar 2.7                      |
| 1996 - Min 2.5 ; Tar 2.0                      |
| 1997 - Min 2.0 ; Tar 1.5                      |

| **SQI 4 - Failures notified by 100 telephone main lines (%)** |
| RI - 15%                                     |
| 1995 - Min 60 ; Tar 50                       |
| 1996 - Min 55 ; Tar 45                       |
| 1997 - Min 45 ; Tar 40                       |

| **SQI 5 - Repair of Notified failure** |
| RI - 20%                                     |
| Notified by the client and solved in 2 working days (%) |
| 1995 - Min 75 ; Tar 83                       |
| 1996 - Min 80 ; Tar 85                       |

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1997 - Min 85; Tar 90
Maximum time to repair failures (working hours)
1995 - Tar 26
1996 - Tar 22
1997 - Tar 18

**SQI 6** - Waiting time for the operator services answer (seconds)
RI - 15%
1995 - Min 60; Tar 45
1996 - Min 45; Tar 30
1997 - Min 25; Tar 15

**SQI 7** - Billing complaints by 1000 telephone main lines
RI - 10%
1995 - Min 55; Tar 30
1996 - Min 50; Tar 25
1997 - Min 40; Tar 17

**b/ Telephone service in the mode of public telephone boxes**

**SQI 1** - Operational level of public telephone boxes (%)
1995 - Min 90; Tar 94
1996 - Min 92; Tar 95
1997 - Min 94; Tar 96

**c/ Leased of circuits**

**SQI 1** - Delivery period (days)
RI - 40%
1995 - Min 60; Tar 30 (typical DP) ; 90 (maximum waiting time)
1996 - Min 45; Tar 30 (typical DP) ; 60 (maximum waiting time)
1997 - Min 30; Tar 25 (typical DP) ; 40 (maximum waiting time)

**SQI 2** - Period to repair (hours)
RI - 20%
1995 - Min 36; Tar 24 (typical) ; 48 (maximum)
1996 - Min 24; Tar 18 (typical) ; 36 (maximum)
1997 - Min 18; Tar 12 (typical) ; 24 (maximum)

**SQI 3** - Availability level (%)
RI - 40%
1995 - Min 90; Tar 95
1996 - Min 90; Tar 95
1997 - Min 95; Tar 98
d/ Leased of interconnecting circuits

**SQI 1** - Period to delivery (days)
RI - 40%
1995 - Min 45 ; Tar 30 (typical DP) ; 45 (maximum waiting time)
1996 - Min 30 ; Tar 20 (typical DP) ; 45 (maximum waiting time)
1996 - Min 20 ; Tar 12 (typical DP) ; 30 (maximum waiting time)

**SQI 2** - Period to repair (hours)
RI - 20%
1995 - Min 24 ; Tar 18 (typical time to repair) ; 36 (maximum)
1996 - Min 18 ; Tar 12 (typical time to repair) ; 24 (maximum)
1997 - Min 12 ; Tar 8 (typical time to repair) ; 18 (maximum)

**SQI 3** - Availability level (%)
RI - 40%
1995 - Min 91 ; Tar 96
1996 - Min 93 ; Tar 98
1997 - Min 97 ; Tar 99

Therefore it seems unlikely that there will be any kind of liberalisation for different types of communications (local and long distance...). It is necessary to protect the public operator in order to protect the user, to achieve some social cohesion namely in the provision of fixed voice telephony. It seems that in this matter, there is consent at the political level.

At this stage a separate point must be made about cable TV and the other services of telecommunication.

Regarding the possibility of liberalisation of fixed voice telephony for the cable TV operators (in accordance with a project of European directive) Portugal's position will not change and the deadline for the derogation continues to be in force. However, this possibility, albeit a future one, raises questions due to the fact that PT is one of the two operators dominant in the market of cable TV. The authorization relative to cable TV were given taking cable TV activity into account and not secondary utilisation of the cable TV network.

For this reason it is probable that the Portuguese situation will have to be altered to be compatible with the rules of competition and that the liberalisation of fixed voice telephony via cable TV will not happen yet. However, in our opinion cable TV
infrastructures could be used to provide services already liberalised, although this solution has not had political consensus until now.

Conclusion

The bringing forward of liberalisation is possible, even probable, but in principle not before the year 2000. The introduction of competition for the fixed voice telephony will be effected for one or two new specialist operators of telecommunications.

We may surmise that as far as mobile telephony is concerned a third of the operators will be authorized (it is the government's responsibility to determine if it is necessary) probably based on a new technical definition (GSM 1800). It is also possible that the Government will authorize the two existing operators to extend their services to new frequencies (for example GSM 900 to GSM 1800). The advantage of this is that investment in this area is directed towards quality of services and therefore benefits the user.

It is too early to know how many operators for each service will be authorized (for example in the case of paging the market is completely saturated because there are too many licences).

We can say that the key for liberalisation of fixed voice telephony has two aspects: rebalancing and regulation of closed group users. In the case of infrastructures the establishment of private networks will only be authorized in the year 2000.

In our opinion is mixed solution is possible for liberalisation: for example a public utility operator which invests heavily in the telecommunications network could merge with a mobile phone operator (as is the case in Germany). This new operator will be subject to some universal service obligations, and we should have a solution similar to that for the mobile phone service when this was opened up to competition.

2°/ The regions and liberalisation

It is customary to think that liberalisation may provoke a discrepancy between rich and poor regions. In a country such as Portugal it is obvious that some regions are less attractive from an economic point of view (principally some of the inland regions and the Azores).
The provision of the Universal Service as defined by the Resolutions\(^{(1)}\) of the Council removes the risk of technical marginalisation of these peripheral regions within the peripheral countries. In Portugal the problems connected with the Universal Service are not as great as for the countries which are obliged to liberalise in 1998. The fact is that the question of Universal Service is problematic in a context of liberalisation and not in a monopoly situation ("exclusive right"). Until the liberalisation PT is responsible for providing a public telecommunications service in terms of equality of access and of price (see references in part I phase III). The fundamental question is that of financing this public service (now called universal service) once liberalisation has taken place (the basic issue here will be the coexistence of PT and one or more fixed voice telephony operators).

Thus, the new licence of PT (February of 1995) specifically provides for the methods of calculation of the cost of the universal service, and its financing.

a/ PT should use a system of analytical accounting to calculate the cost of the universal service (art. 20). The choice and the viability of the accounting system will be controlled by the ICP in order to achieve the former's aims.

b/ As regard financing, in art. 25 of the new licence of PT, there is provision for several possibilities: access charges, financing funds, reduction by the government of the annual fee paid by PT.

In spite of all of the above, in our opinion the problem of the peripheral regions of Portugal can be solved through two types of measure. Firstly, an ongoing investment in the public network to allow the peripheral users better access to the basic and advanced services. This is one of the major obligations of PT in virtue of its new licence. It is generally understood that liberalisation could offer an opportunity to the regions as long as certain economic realities are taken into account. Therefore any liberalisation would be an illusion without previous technical development of the public network (namely digitalisation) and tariff rebalancing.

Secondly, the question of the universal service arises in slightly different terms in the case of the ultraperipheral regions. In our opinion, liberalisation would be a success if the universal service could be provided by various operators (and not necessarily only by the incumbent). This means that this regions mostly require a specific technical solution in conjunction with a specific financial solution. For example universal service could be supplied by means of radio; this is possible and could even be profitable if it is supplied with a sound economic base and with, for example, regional government subsidies (this solution already exists in Galicia).

\(^{(1)}\) Resolutions 93/C 213/01 and 94/C 48/01 and the resolution of the Council of telecommunications of 13th of June 1995.
We must recognise that this technico-financial solution for the ultraperipheral regions cannot be generalised. There are problems at local level which are therefore related to a certain political determinism too where a regional government exists (this is the case of the Azores and Madeira).

In the case of peripheral regions (but not ultraperipheral) the provision of the universal service is related, sooner or later, to the real utilisation of technical resources. In this way the limits of the universal service cannot be over-extended if the risk of overburdening the incumbent is to be avoided. For this reason the coverage of the whole country by a wide band network is not justified. Firstly it is necessary to make the new services commonplace in the urban areas to then proceed with extension to the rest of the country. Thus it seems that the first objective will be to cover the country with a digitalised infrastructure and then to obtain a narrow ISDN band.

In 1998 95% of the public switching is planned to be digital, allowing the provision of advanced services. We can observe that Telepac (which manages the PSND of PT) has a highly ambitious plan to install central X.25s in all medium-sized cities of the country to allow the provision of services based on this technique. According to available information this plan should be completed before the middle of 1996.

We can surmise that the difference between urban and rural areas will continue to exist in the telecommunications field. However the obligations of the universal service (in Portugal at least) will allow advanced characteristics of the infrastructure and new advanced services to be available to the more distant users.

3º/ The universal service

It seems that the best solution for the Portuguese regions is the concrete and real implementation of PT's obligations to provide the public services in terms of the universal service. In fact this will be the first time that PT is obliged to reach quantitatively and qualitatively objectives. Obviously, the control of these objectives is the responsibility of the ICP, which should assess if PT achieves the goals that the law imposes on it. We should remember that the new PT licence contract is very advanced in relation to the community law (At the moment, there exists no legal provision
which obliges the member States of the EU to adopt universal service objectives and to take into account its financing).

Once more we should refer to the definition of the universal service:

The concessionary is obliged to operate the following services:

- Fixed voice telephony
- Telex and telegraph
- Packet switched data service (Which is provided by Telepac a PT affiliated group company)
- Leased lines service

PT has to operate/provide these services in terms of Universal Service. The Universal service is defined by the law as follows:

Satisfaction of the needs of communication of the population and economic activities throughout the national territory, in term of equality, continuity and fairness of prices. The requirement of economic development and social harmony and balance should be taken into account (art. n°1/0 of the law). In addition to these general obligations, each type of public service has specific obligations:

*In the case of fixed voice telephony (art. 10)

- To guarantee equality of service independent of persons and geographical location (throughout the national territory, even for the administrative regions);
- To take into account groups of citizens will special needs (the handicapped economically underprivileged groups - retired persons and pensioners);
- To guarantee/insure a high standard of quality of service and technical capacity.

In addition to the new licence, PT and the ICP have signed an agreement which describes in detail the obligation of the operator in the area of tariffs.

Taking into account the Portuguese situation of telecommunications, we think that, coexisting with sub-sectors which are already competing on the market, it is necessary to preserve social cohesion, making a quantitative and qualitative investment in the public network and the provision of the basic services.

*In the case of infrastructures (art. 21)
Art. 21 of the new PT licence contract should be the specific instrument of the universal service. It establishes objectives for the development of infrastructures, for minimum supply of services, technical characteristics and advanced resources and, finally, for models and guidelines of quality for services for PT (in addition to the provisions of the Art. 21 of the licence, PT and the ICP have to sign a specific convention relating to these objectives).

In spite of these detailed obligations, we think that some alternative solutions could also be implemented at local level (which answer local needs). Once again this is the responsibility of the government, which, however, has not taken any initiatives in this area. Notwithstanding this situation, licences in the VSAT sector, and new and complete utilisation of the radio's potential, for example, could complement the universal service, but in no way substitute the fundamental role of the public operator in providing the universal service (namely for some inland regions and for the nine islands of the Azores).

**Financing the universal service**

Art. 25 establishes several methods of financing the universal service: access charges, financing funds and even a reduction in the annual rent that PT pays to the government. Until now, obviously, none of these have been chosen. We note that these methods are compatible with the options contained in the Telecommunications Council resolution of 13th June. As long as the cost of the universal service is precisely defined, at the moment it seems that the financial funds method is favoured. The question now is to establish if these funds are to be financed by the new entrants or by the State (since PT provide a service of general interest, this is acceptable). It seems to us that the new entrants will prefer to let the State pay on condition that the whole process is carried out with transparency.

The type of solution currently used in New Zealand, "Pay or play", is another possibility, even if we think it is difficult to implement in Portugal.

In addition, the Telecommunications Council resolution of 13th June 1995 allows for the possibility of constituting a Community fund which could be used to finance the Universal service in the EU countries. This community fund should be considered as the equivalent of a "cohesion fund" which will complement existing funds at national level (this arrangement is a typical example of the principle of subsidiarity).

In this way the make up of the financing/guarantee funds could have various sources (European and national) but its utilisation will always be tightly controlled.
4º/ The role of the ICP

It seems that the multiplicity of entities involved in telecommunication regulation (in its widest sens) will continue to exist. Thus, the ICP, which is a vertical regulator specialising in the telecommunication sector, requires additional and complementary regulation. For this reason its role is complemented by entities which operate horizontally, such as the Directorate General of Competition and Prices, and the Institute of Consumers. All of the above is true of, for example, the fixing of prices of the public service of telecommunication.

It should be noted that the role of the ICP was broadened with the signing of the new PT licence and the new regulation of leased lines. This increase of its powers shows that the ICP is increasingly becoming the central entity of regulation of the telecommunication market.

Composition of the ICP

The ICP is an independent institute in charge of regulating one sector. It is an example of "indirect administration". For this reason its composition must, to some extent, be representative of Portuguese society. The autonomous regions and the Consumer Organisations, for example, each have a representative in the Consultive Council. It seems that this situation will not be altered: firstly, the other regions are not represented because they do not have administrative independence and secondly, the national policy for the telecommunication sector is general and not regional. Therefore if Madeira and the Azores have specific characteristics of their own, this is not true of the rest of the country (even for the less privileged continental regions).

However, it is clear that the quantitative and qualitative objectives contained in the new PT licence (and the coverage targets of the mobile operators) take into account the difficult socio-economic reality of the interior of the country.

5º/ The position of Portugal Telecom (PT)

Portugal Telecom (PT) as the incumbent several problems to overcome in the period preceding total liberalisation (we should remember that the current chairman of PT has indicated publicly that this will take place in the year 2000).
a/ The most important task is to carry out tariff rebalancing to be able to face competition. We have already seen that this is being undertaken through a programme established for this purpose (see the reference to the tariff convention between the ICP and PT in the first part of phase III).

b/ PT should continue to invest heavily in its network to digitalise it as much as possible. This obligation is being undertaken through the application of the objectives of quality and quantity, as defined in its licence. (In addition to the provisions of the licence, PT and the ICP have to sign a specific convention relating to these objectives).

c/ The management of PT has the objective to drastically reduce the number of its employees. This implies a reduction of 10% per year until the end of 1997. At the end of this process, PT will employ 16.000 people.

d/ There are decisions to be made which are related to political options: the continuation of the process of privatisation and the possibility of a strategic alliance between PT and a foreign operator or a European consortium. It is likely that the company will be privatised from 28% to 49% of its capital over the next year, particularly if the centre-right stays in power (the current Minister of Telecommunication has made a declaration to this effect). The law concerning the public sector could be modified to allow even greater privatisation (perhaps up to 70%), the State maintaining a minimum participation.

At the moment it is not known what will happen if the socialists come to power. However, it is probable that the second phase of privatisation (from 28% to 49% of the capital of PT) will take place.

Concerning the strategic alliance, a certain amount of indecision still remains: no decision has yet been taken, and the second phase of privatisation seems to have priority status. (Before the first phase, the strategic alliance was foreseen to be the next step, having priority over the second phase).

Nevertheless, the company requires an alliance of this nature for its commercial future. Nothing seems to be decided in terms of its partners but three possibilities exist: BT-MCI, AT&T-Unisource and Sprint-Deutsche Telekom-France Telecom.

For the problems of privatisation and the strategic alliance, the electoral period hinders the possibility of having a clear vision of the future.

e/ As partial liberalisation (by sectors or geographical areas) has met with no approval here, it is likely that PT will fight for one licence only to be granted instead of several licences to operators specialising in different areas of the market (for example long distance, local loop or leased lines...). This situation would lead to a
duopoly, in which case the new operator should also be responsible for a general or partial universal service.

It is this scenario which is favoured by PT (and the Government and the ICP) at the moment. However, it is clear that this scenario is not a foregone conclusion. In our opinion, for political reason any type of liberalisation is possible (by sectors or even by geographical areas) in the future (after the year 2000).

6º The liberalisation of telecommunications in the sub-sectors

The four sub-sectors are Health, Tourism, Dairy and Footwear. (concerning the justification for the choice of these sub-sectors and the general problematic of each one - see, Phase II, Portfolios, introduction).

Generally speaking we can say that these sub-sectors require two different things of a telecommunications system: Infrastructures with capacities to permit the high level provision of technical resources (at the moment this is not the case in Portugal); Tariffs established to take into account the real price of communications. At the moment, we can already surmise that there is no legislative barrier in this field; above all, the problem is a question of technical capacity of the network and fairness of prices. However, we consider that the Portuguese situation will substantially change with regard to the latter 2 questions before the liberalisation.

In the case of public health, the problem is also political. We consider that it should not be difficult to establish a specific infrastructure for the health system; probably, the question would be how to manage the medical data base of the citizen to be in line with the Portuguese constitution and the law related to data protection.

In the other sub-sectors, we cannot say that the legislation would have a real influence on them, as they have no characteristics to be considered specifically in the telecommunication laws.

7º Conclusion

Social cohesion in Portugal is not threatened by the liberalisation of telecommunications for two types of reason:
- Portugal has already defined its universal service, which guarantees the homogeneous installation of an increasingly digitalised infrastructure with advanced resources allowing for the provision of many services.

- Portugal is prepared to face general competition in the next century. Until now all the new entrants (for example mobile telephony) are subject to quantitative and qualitative obligations (for example coverage target), which guarantee a high level of equality of access. Any future entrants (namely for fixed voice telephony and infrastructures) will probably be subject to the same obligations.

The question of the ultraperipheral regions should have a solution which is specific, technical and financial, and which should be analysed case by case. The Regional Governments have a vital role to play in this process. It is by no means certain that the incumbent will always be the operator best placed to provide the universal service in these regions.

In the final analysis we can say that the question of social cohesion and access to the technical capacities of the Information Society is closely linked to the problem of the individual's spending power. This is the greatest limit to social cohesion in this sector.
ANEXO 1

RESPOSTA AO QUESTIONÁRIO DA EQUIPA CENTRAL

Information Society Gap: Winners and Losers
An Image About Portugal
European Project

"Information Society and European Cohesion"

Report on Phase I:

Information Society Gap: Winners and Losers

An Image about Portugal

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Tomaz Ponce Dentinho
Miguel Faria
Rita Dias Coelho
23 May 1995

Introduction

This document is part of the contribution of the Portuguese team to the first phase of the Project "Information Society and European Cohesion" coordinated by NEXUS Europe fro Dublin. The purpose of this report is to create an image about the socio economic effects in Portugal associated with the development of Information Society in Europe and in world. This image stems from a well defined data collection proposed by the Core Team to every national partner which facilitates the connections with the other reports produced for Greece, Ireland and the south of Spain and Italy.

The report is divided into two main parts: in the first part we attempt to fulfill the questionnaire envoiced by the Core Team targeted to collect compatible data from every region; in the second part we try to give a synthesised answer to the questions proposed by the Core Team about the perceived development of the Information Society in Portugal.

I Part : Extended Questionnaire

1. ACCESS

The evolution of telecommunications in Portugal gives two different pictures according to the nature of the provider.

- Services protected by legal monopolies are developing regularly but Portugal is still one of the more expensive countries of the OECD in terms of tariffs.

- Liberalised services appeared only recently but they have developed fast using market niches and, somehow, profiting from the expensive tariffs applied in the services provided by the legal monopolies.
The regular development of Portuguese public telecommunications can be expressed by telephone density that doubled from 1988 to 1994, when it reached 35 ML/100 Inhabitants. During this period - and stimulated by the European support programs (STAR), the percentage of digital lines rose from less than 5% in 1988 to almost 60% in 1993. The average waiting time for a telephone installation is still four times higher than for the European average (except Greece); however, it is decreasing steadily and in 1993 was just two month compared with 4 month in 1992. The percentage of unsuccessful calls is also two times higher than for the European average; this can be explained by inappropriate systems installed in businesses but there is as well a great amount of investment that must be done in multiplexers and optic fibre links. The target for 1999 is to have 47 lines per 100 inhabitants, 75% subscribers connected to digital network and a reduction in average waiting time to less than one hour.

The telecommunications liberalised area registered a strong development from 1992 onwards. Land Mobile Services - with two providers since 1991 - grew from 37262 posts in 1992 to 173508 in 1994; one of the providers (Telecel) estimates that in 1995 there will be 250000 customers and, by the year 2000, 600000. Paging - with five providers since 1992 - increased from 31242 customers in 1992 to 88238 in 1994. Trunking services - with two operators in 1994 - has 1304 customers; this service, implemented in the beginning of 1994, will concur for the clearance of the radioelectrical spectrum due to an expected migration from some private network users. It seems interesting to refer that - according to Afonso Cascão from COMNEXO - the adoption of GSM would not took place without the competition between the private provider of mobile telephony (Telecel) a the public counterpart (TMN); which, at the moment, had not already recover the investment in analogue mobile telephony.

These outcomes from the liberalization of certain areas of telecommunications confirms, somehow, the idea of the Portuguese Minister for Industry (Engº Luís Mira Amaral) who states that there is no need to privatise the public provider of telecommunications, what is important is to liberalise the market of telecommunications under acceptable rules.

According to private providers there are still some regulatory anomalies which constraint the development of telecommunications and which have to be addressed by the regulator (Instituto de Comunicações de Portugal - ICP). One of these cases is that the operators of mobile services must pay the full cost of leased lines and are not allowed to install their own microwave trunk circuits; as a result between 35% and 40% of total costs go for interconnections and leased lines compared with around 8% in the UK. Another example of regulatory anomaly concerns the constraint imposed
on Cable TV suppliers that prevents them to provide interactive systems. A third example is given by Afonso Cascão, the manager of a private provider (COMNEXO), who stresses that there are companies that operate in the market without any license under the umbrella of the public providers which then compete unfairly with the legalised private companies.

ISSUE 2. QUESTIONS ON USER AFFORDABILITY

1. Total number of local call areas.

In Portugal there are 51 local call areas. As there are about 3.4 million lines, each local call area includes, in average, 67000 lines. Nevertheless, some of these local areas are much smaller than others; for instance local calls in Lisbon can get almost 1 million lines whereas in more remote places just a few hundreds can be reached paying local tariffs.

Table 1: Basic Equipment and software costs

<table>
<thead>
<tr>
<th></th>
<th>Portugal, May 1995</th>
<th>Cost in ECUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard PC (486DX2/66; 8Mb RAM; 500Mb HD)</td>
<td></td>
<td>1297 - 1545</td>
</tr>
<tr>
<td>14400 Baud Modem</td>
<td></td>
<td>128 - 257</td>
</tr>
<tr>
<td>Basic Fax</td>
<td></td>
<td>360 - 721</td>
</tr>
<tr>
<td>Microsoft Professional 4.2 Software</td>
<td></td>
<td>366</td>
</tr>
</tbody>
</table>

1 ECU = 194.17 PTE

The price of a standard PC (486DX2/66; 8Mb RAM; 500Mb HD) is about 1545 ECUs, if we choose a well known manufacturer. If we want a Taiwan made machine, we can have it for less than 1287 ECUs. The PC prices have fallen quite a lot for the past couple of years.

The price of a 14400 baud modem depends whether it is an homologated model or not. For a non-homologated model, the cost can be around 129 ECUs. A homologated one can cost 258 ECUs. For the basic telephones the situation is the same. An homologated set costs about 52 ECUs, whether the cost of a non homologated one can start at 15 ECUs.

A small PBX can have a starting cost between 412 ECUs and 1030 ECUs, whether is homologated or not, and a FAX machine cost can start between 360 ECUs and 721 ECUs.

Although non-homologated apparatus are not supported by Portugal Telecom, there is a large number installed, mostly cordless telephones.

An important part of the software used in Portugal are illegal copies. The private users still use pirate software but companies are inverting this tendency. The cost of a licence of Microsoft Office Professional 4.3 can be near 566 ECUs, but there are quantity discounts.
The monthly tariff for the basic telephone service costs 8.75 ECU. An ISDN basic access costs 190.55 ECU. There is no regional variation, because the telephone service is considered a social service.

Table 2: Tariffs and initial connection fees for ISDN and PSTN

<table>
<thead>
<tr>
<th>Private Tariff</th>
<th>PSTN (1)</th>
<th>ISDN Basic (1) (2)</th>
<th>ISDN Premium (1) (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local</td>
<td>National</td>
<td>International</td>
</tr>
<tr>
<td>Peak Usage Tariff</td>
<td>0.018</td>
<td>0.037</td>
<td>2.637</td>
</tr>
<tr>
<td></td>
<td>0.025</td>
<td>0.031</td>
<td>2.637</td>
</tr>
<tr>
<td>Lowest Peak Usage Tariff</td>
<td>0.005</td>
<td>0.055</td>
<td>0.612</td>
</tr>
<tr>
<td></td>
<td>0.005</td>
<td>0.077</td>
<td>0.612</td>
</tr>
<tr>
<td>Connection Fee</td>
<td>72.69</td>
<td>190.55</td>
<td>231.75</td>
</tr>
<tr>
<td>Monthly Subscription</td>
<td>8.75</td>
<td>21.04</td>
<td>231.75</td>
</tr>
</tbody>
</table>

1 ECU = 194.17 PTE
(1) per minute (2) per channel

This is a static image. Along time, tariffs decreased 30% in real terms from 1989 to 1991 and stabilised more or less at the same level since then (Figure 1)

Figure 1: Evolutions of Real Prices of Telephone Services in Portugal

Nevertheless, the evolution of tariffs is quite different between national calls and international calls; the price index of national calls decrease from 100 in 1991 to 70 in 1991 but, afterwards increased until 1995 in 95; the price index of international calls has decreased from 100 in 1986 to 55 in 1991 and 40 in 1995. According to the Minister for Industry the reduction of international prices of telecommunications supports the competitiveness of export companies which use intensively telecommunications with outside partners. The problem, we may argue, is that SME that must change information with domestic partners have to face increasing communication costs.

In relation to other countries, tariffs are still very high. For instance, comparing the cost of a basket of entrepreneurial telephone calls for different countries it is proved that, in terms of purchasing power parity, telephone costs in Portugal are the highest in Europe, three times higher then in Denmark, 50% higher than in the UK and 10% higher than in Spain and Italy.
ISSUE 3. QUESTIONS UNDER EXTENSION OF USAGE

In Portugal there is penetration rate of 35 telephone lines per 100 inhabitants in 1994 (from 15 in 1987). 78% are residential subscribers, 21% are business subscribers and 1% are public pay phones. The Lisbon area present PSTN penetration rates ten points higher than for the whole Portugal and this image is similar to the other services.

ISDN started in 1993 as a pilot project. By the end of 1994 there were 1 500 basic access lines and 280 primary access lines, a negligible penetration. According to "Expresso", 10 April 1995 - Caderno Privado p.9, the number of ISDN subscribers was 1650 in 1993 but rose to 12000 in terms of installed connections in 1994. These connections were demanded mainly by multinationals and large companies.

Analogue Mobile - although one of the success stories projects highlighted in the evaluation of the STAR program - is disappearing in Portugal due to the success of Digital Mobile. In 1993 there were 0.34 analogue mobile telephones per 100 inhabitants.

Digital Mobile (GSM), is suffering a boom since 1989, the year of introduction of the service. In 1994 there were 185000 subscribers, what gives a penetration rate of 1.8 telephones per 100 inhabitants. The forecast for this market is a growth of 25% per
year in the next couple of years. The Paging market is also growing, despite the GSM boom. The service low cost has lead to a market of 90 000 subscribers in 1994. In the Azores islands there is no GSM Mobile and the same happens in some remote regions in the mainland.

Table 3: Subscribers of Information Services

<table>
<thead>
<tr>
<th>Service</th>
<th>Year</th>
<th>Number of Subscribers to the System</th>
<th>Penetration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Residential</td>
<td>Business</td>
</tr>
<tr>
<td>PSTN</td>
<td>1994</td>
<td>2686000</td>
<td>723000</td>
</tr>
<tr>
<td>ISDN Basic</td>
<td>1994</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>ISDN Premium</td>
<td>1994</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>Cable</td>
<td>1994</td>
<td>18000</td>
<td></td>
</tr>
<tr>
<td>Analogue Mobile</td>
<td>1992(2Q)</td>
<td>30000</td>
<td></td>
</tr>
<tr>
<td>Paging</td>
<td>1994</td>
<td>90000</td>
<td></td>
</tr>
<tr>
<td>GSM Mobile</td>
<td>1994</td>
<td>185000</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Availability of advanced telephone services

<table>
<thead>
<tr>
<th>Service</th>
<th>Does it Exist</th>
<th>How Many Subscribers</th>
<th>How many calls made</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freephone</td>
<td>Yes</td>
<td>::</td>
<td>::</td>
</tr>
<tr>
<td>Direct Extensions</td>
<td>Yes</td>
<td>5%</td>
<td>17880</td>
</tr>
<tr>
<td>Conference Calling</td>
<td>Yes</td>
<td>::</td>
<td>::</td>
</tr>
<tr>
<td>Call forwarding</td>
<td>Yes</td>
<td>::</td>
<td>::</td>
</tr>
<tr>
<td>Detailed Billing</td>
<td>Yes</td>
<td>::</td>
<td>::</td>
</tr>
<tr>
<td>Value Added Numbers</td>
<td>Yes</td>
<td>::</td>
<td>::</td>
</tr>
</tbody>
</table>

: No data available from Telecom Portugal

Cable TV is only starting. The services commenced in Madeira and Açores islands in previous years but only started in the mainland in November 1994. By the end of 1994 it had about 18 000 subscribers. This cable subscriptions are only in the islands where the market can expand up to 25000. By the end of 1995 it is expected 60000 subscriptions in the Mainland but the aimed target is 400000 subscriptions in the main portuguese towns ("Expresso" 4 March 1995, by Alexandre Coutinho)

The advanced telephone services available are the following:

- Direct extensions - When calling an extension of a PABX connected to a digital public switch, it allows the usage of a range of telephone numbers, each of them accessing an extension of the PABX. Medium and large companies are starting to use this service. Digitalisation of the local switches has reached 62% in 1994 and is growing at a good rate, so this service is becoming more and more available.

- Green number - These are free numbers used mostly to public information. Government entities, insurance companies and banking are the major customers for this service.

- Value added number - Are telephone numbers with higher taxes than the normal numbers. They are used for information (weather report), television (program selection, opinion survey) and commercial purposes (sex, contests). This service has had a very good acceptance, mostly by teenagers. The telecommunication company
had so many parent complains that they had to deny access to these services by customer demand.

- Fixed destination line - This service provides the possibility of establish a call automatically to a pre-determined number. It is not a very used service.

- Call forwarding - Allows the redirection of calls from one number to other. It's not a very used service.

- Detailed billing - Although this service has been announced, several customers that asked for it have been refused. If the service is already available, the penetration is very low.

<table>
<thead>
<tr>
<th>Table 5: Telecommunication Traffic in Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>1994</td>
</tr>
<tr>
<td>Local Calls</td>
</tr>
<tr>
<td>Trunk Calls</td>
</tr>
</tbody>
</table>

In terms of traffic charges, 26% comes from international calls, 44% from national calls and 30% from local calls.

Interestingly there is a strong difference between in-going and out-going international calls which - assuming similar needs to communicate - can be explained either by differences in tariffs (price effect) or by differences in the relative affordability for telecommunications expenses (income effects).

<table>
<thead>
<tr>
<th>Table 6: Users of EDI, videoconferencing, videotex and other vans.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>EDI</td>
</tr>
<tr>
<td>VideoConferencing</td>
</tr>
<tr>
<td>Videotext</td>
</tr>
<tr>
<td>Packet Switching</td>
</tr>
<tr>
<td>Other VANS</td>
</tr>
</tbody>
</table>

*: no data available

**“Public Network” June 1993 Volume 3, No 6, p.41-48
***“Valor” 15 April 1994, p.54-55.
**** “Anúncio Estatístico do Portugal”, 1994

EDI started in 1990 but is growing slowly. Retail and car component industry are the sectors that are starting to take-off.

Videotex has been a major flop in Portugal due to several reasons. Expensive terminals, low transmission speed and uninteresting services. Service providers were limited because there were few customers and customers were few because the ratio cost/benefit was high; in 1994 there were 15000 terminals and service providers estimate that more 30000 are needed to turn the business sustainable. Moreover,
videotex has been launched when people started talking about alternate information sources, like international databases and BBS (with a PC and a modem who needs videotex?). Right now videotex is being enhanced with the possibility to access multimedia databases but we still do not know the acceptance it will have.

Videoconferencing is not a very used service due to its price and also because there are many substitutes. There are a few companies using it, mostly over ISDN lines. There is a public service of videoconferencing which usage has grown 62% in the number of sessions between 1993 and 1994.

Table 7: Internet provision and usage

| Number of Internet Providers | 4 |
| Number of Internet Users    | 20000 - 30000 |
| Annual rate of increase     | ~100% |
| Significant regional variations | Yes |

For commercial purposes Internet is starting in Portugal. There are only 4 Internet providers, one of them providing services only to the scientific community and universities. One of the remaining doesn’t have national coverage. All the providers are located in Lisbon. There are about 20 000 to 30 000 users, but this number doubles annually, because the service is only starting to be available to the general public. Most of the users are in the areas of Lisbon and Oporto.

There is a project to link schools and high schools in Portugal during 1995. The main objectives are to stimulate knowledge diffusion between students, to promote discussion, to support projects and to develop the contact between students and teachers.

Table 8 Computer usage and network connections in schools

| Proportion of Schools with computers for use by students | 54% |
| Proportion of schools with network connection | (project) |
| Any indication of upward trends in these proportions | Yes |
| Significant regional variations in any of the above | No |

Table 9: Proportion of Households with PCs

<table>
<thead>
<tr>
<th>Personal PCs in Portugal</th>
<th>Year</th>
<th>% Increase 93-94 or specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>160000</td>
<td>1994</td>
<td>9%</td>
</tr>
</tbody>
</table>

The market for personal computer is not growing as much as expected. In 1993 there were about 146000 systems in both domestic and business market and in 1994, with a growth of 9%, this figure reached 160000 machines. It is not possible to separate personal PCs used by firms and personal PCs used by households.

ISSUE 4 QUESTIONS OF EFFECTIVENESS OF USAGE

In Portugal there are some sectors beginning to make use of advanced communications. Surprisingly, traditional sectors like footwear, moulding and the car industry are exemplar uptakers of new information technologies.
- Industrial sectors with external partners - like textiles, car components, footwear or casting boxes - are starting to use EDI and Electronic Mail mostly by external pressure. For example, car components companies are pushed by car manufacturers and uses ODETTE standard. Nevertheless there isn't any ODETTE group in Portugal so it is difficult to have accurate figures.

- In the distribution sector the retail is pressured by the main distributors, like Makro and Sonae distributors, to adopt EDI systems. The retail uses EANCOM subset, represented in Portugal by COPIDOR. According to their figures in 1993 there were about 10 companies using this subset. By the end of 1994 the number of companies using EANCOM were about 30.

- The financial sector - like banking and insurance companies - began to use advanced communications, usually electronic mail and access to external data bases. There are other sectors which are beginning to think about that technology; insurance companies, paper industries, textiles and electricity are planning to use EDI in the near future.

Table 10: Diffusion of Information Technologies in Portuguese Economic Sectors

<table>
<thead>
<tr>
<th></th>
<th>EDI</th>
<th>Leased Line</th>
<th>Videotex</th>
<th>ISDN</th>
<th>E-mail / Internet</th>
<th>On-line Databases</th>
<th>Packet Switching</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td>*</td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>*</td>
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<td>7</td>
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<td>**</td>
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<td>8</td>
<td>***</td>
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<td>***</td>
<td>***</td>
</tr>
<tr>
<td>9</td>
<td>***</td>
<td>***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>***</td>
<td>**</td>
</tr>
</tbody>
</table>

* low; ** average; *** high

A market research undertaken by BIS Strategic Decisions (Telecommunications Industry in Portugal, 1992) indicates that - apart from education and public administration - three private areas represent the best opportunity areas for telecommunications development. These are the financial services, tourism and manufacturing subcontractors.

- In the financial sector, although international banking is a standardised business, much customization is required at the local level. This can explain the difficulties faced by foreign banks and the strategy for international capital to participate or create local banks instead of spreading branches of external banks in the local market. The main market drivers in the Portuguese financial sector are: technological innovation, exemplified by a system called SIBS which is a manager of automatic cash machines, payment terminals and inter-bank telecompensation; deregulation of the financial sector providing a stimulus to access international money markets through the use of
IT; the expansion of branch networks from Lisbon to the rest of Portugal; the expansion of the stock exchange, resulting in a growing demand for financial information services/dealer boards and the installation mainly by multinationals of office automation systems.

- Tourism represents a large market sector in Portugal demanding high levels of IT for reservation systems, databases, closed user group messaging and voice services for the providers of travel related services. The main market drivers are: the perception of Portugal as an increasingly attractive venue, the desire of tourist regulators to ensure a high quality image for touristic facilities; the need for IT systems to monitor the activities of a growing mobile population, to assist with seasonal overcrowding of existing telephone infrastructure; and to manage the increasing passenger traffic.

- The potential to manufacture as subcontractor to multinationals can increase in other sectors as it has already done in the automotive sector. Value added services based on data messaging will be required as well as quality measurement systems. Market drivers for manufacturing subcontract in Portugal include: relatively low cost of Portuguese labour, tax incentives and subsidies; and the opportunity for building rapid response information systems.

According to the Minister for Industry the Portuguese competitiveness improves even with the transference of some activities to outside. Unskilled labour has problems but there is a benefit for more qualified people. The problem of the information society - he continues - is the need for accurate compensation measures suitable to deal with the increasing social duality. It is not clear that advanced communications will reduced the competitiveness of lagged regions. He finally argued that compensation measures must include necessarily training and education policies.

ISSUE 5. INVOLVEMENT IN INFORMATION SOCIETY PRODUCTION ACTIVITIES

In a 1992 study undertaken by BIS (Nymex company) about Software and Information Services in Portugal, which main objective was to identify and recommend Government policies, programs and measures to maximize growth in Portugal's Software and Information Services Industry, there are interesting analysis for this report. A preliminary image is that Portugal's Investment in Software is significantly below other European countries, as presented in the Table below.

This situation is explained not only by the lack of skills in qualified graduates, suppliers and users but also by the difficulties of SME suppliers in employing qualified staff because graduates prefer employment with the larger suppliers and in Lisbon. Furthermore it is difficult to get seed capital and funding for start-ups, the
level of exports is quite low and the same happens with local users awareness. In the end initiatives to stimulate the development of Software and Information Systems Industry in Portugal must address both supply and demand.

<table>
<thead>
<tr>
<th>Country</th>
<th>S/W &amp; IS size % of GNP (1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>1.53</td>
</tr>
<tr>
<td>France</td>
<td>1.45</td>
</tr>
<tr>
<td>UK</td>
<td>1.38</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.38</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.25</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.08</td>
</tr>
<tr>
<td>Germany</td>
<td>0.89</td>
</tr>
<tr>
<td>Italy</td>
<td>0.76</td>
</tr>
<tr>
<td>Spain</td>
<td>0.53</td>
</tr>
<tr>
<td>Greece</td>
<td>0.38</td>
</tr>
<tr>
<td>Portugal</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Another study about the Telecommunications Industry in Portugal selects six opportunity areas taking into account the Portuguese market size, the accessibility of the product market both within and outside Portugal and the existing activities of Portuguese telecommunications equipment manufacturers. These areas are rural switches; transmission multiplexers; PBX; test, measurement and environmental control systems; remote monitoring and control systems and toll collection, prepayment and emergency systems. Most of these products are low value added and its productions does not necessarily create an innovative environment between producers ans users.

In an interview the Minister for Industry argued that Portugal has no capacity to compete with the providers of big systems and equipments but there are niche markets for the production terminal equipments and applied software which are being exploited by some Portuguese companies. The financial system developed by SIBS, the green line system of payment for Portuguese motorways, satellite communications in remote areas developed by Marconi and automatic stores provided by Efacc are some of the examples pointed by the Minister.

ISSUE 6 QUESTIONS ON THE PRESENCE OF PREREQUISITES

Engº Luis Mira Amaral - Minister for Industry - states that there are cultural barriers that constrain the adoption and use of advanced communications namely within companies where there is no consciousness about the organisational implications of advanced communications.

I. Can firms afford to invest in advanced services?

The major companies have found the benefits of some of the advanced services, and started using them, but the SME are a little far away from these technologies. Some of
the advanced services, like videoconferencing, are too expensive for a small company. Some other, like call forwarding or direct extensions, are only available in digital lines and don't seem to be very attractive to small companies. Another group, like electronic mail or EDI, is only interesting if the companies have got suppliers or customers using the same services.

Only a few small companies invest for themselves. Most of them are only interested in advanced services if they are funded and introduced in sectorial programs. This has the benefit of decreasing the investment and to associate a group of companies with the same interests or business.

There have been some pilot projects, namely in the Public Administration, which failed due to the human factor. Older people still have afraid of the information systems, not only because they do not know how to use them, but also because it changes his way of doing things and because they think younger people will take their jobs. There is a need of information about the new solution, training in its usage and support during the initial phase. Some projects that didn't had this into account didn't succeed.

2. Do firms managers have the organisational and technical capacity to use services effectively? Is there "human factor" failing?

According to Afonso Cascão, the manager of COMNEXO (provider of communication services) most Portuguese companies use low level technologies and have no aptitude to adopt and use information technologies. He also stresses that Portuguese participation in European research projects in the area of information technologies is very low; arguably Portugal should get 3% of the total budget but it only uses 0.3%. There is an internal barrier to access the information about projects and most research projects have not anyone connected to the commercial area.

Proportion of 18-19 year is entering Higher Education (Source: Ministry of Education):

<table>
<thead>
<tr>
<th>Year</th>
<th>88/89</th>
<th>89/90</th>
<th>90/91</th>
<th>91/92</th>
<th>92/93</th>
<th>93/94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion</td>
<td>20.1%</td>
<td>25.6%</td>
<td>31.2%</td>
<td>32.2%</td>
<td>38.8%</td>
<td>39.1%</td>
</tr>
</tbody>
</table>

The proportion of students with 18 years old entering in higher education has been risen steadily in the last years. From 20.1% in 1988/89 it increased to 39.1% in 1993/94

Proportion of the adult population with a university qualification (Source: Census 1991)
The proportion of the adult population with a university qualification (full degrees) was 3.92% in the 1991 Census. From the profile of the Figure above and considering the evolution of the number of students entering in higher education, that number will tend to increase steadily in the future. There is also an important increase in the proportion of the population with postgraduate degrees.

A different indicator is the proportion of the adult population with more than the secondary level which was 6.3% in 1991. In the Lisbon area that proportion was 9.3%.

What is the level of development of library services?

In Portugal, 1992, there were 1534 libraries with 217 with more than 20000 books. In 1989 there were 1454 libraries with 159 with more than 20000 books.

ISSUE 7 QUESTIONS POLICY AND LEVEL OF PUBLIC DEBATE

In Portugal the public debate more related with the Information Society focus the process of liberalisation telecommunications and the privatisation of the public suppliers of telecommunication services.

Actually, from the reports on the V Portuguese Congress on Communications held in the last quarter of 1994 it is clear there is a general awareness about the evolution of the European market of telecommunications, namely in which concerns the increasing competition associated with it, and its effects on the relative competitiveness of the national sector of telecommunications. The conclusions of this Congress are mostly policy driven and they stress the urgency to develop Portuguese telecommunications before the liberalization of the European market. The message is clear: internal liberalization, privatization of the public provider of basic services and accurate
regulation. Interestingly, in the closing speech, the Minister of Industry stressed that not only internal but also external liberalisation should proceed because, arguably, "it is not possible to give the national industry the opportunity to provide products which are not competitive at an international level.

Not surprisingly, connected with the process of liberalisation - due before 1998 in most of the European countries and until 2003 in Portugal - the main theme of the public debate around telecommunication policy concerns the privatization of the public suppliers. The process undertaken so far involved: first, the separation of the big supplier of telecommunications from the mail services; then, the concentration in one company (Comunicações Nacionais) of four public suppliers of telecommunications (Telecom, TLP, TDP and Marconi) dispersed on geographical terms. Finally, the process of privatisation itself, probably to be proceeded gradually.

Apparently, the main aim of the persons in charge of the privatisation process is to keep some degree of control in Portuguese hands and to maximize the privitization revenues. Nevertheless, the lack of sufficient Portuguese venture capital (the privatization of telecommunications will represent around 10% of the Portuguese capital market) and the structural problems of the Telecommunication Company (redundancies and debths) creates some constraints on those aims. The solution is therefore to select international partners, and a few European companies are already aware of the privatisation process of Portuguese telecommunications.

This process is often critisised. On the one hand, the strategic partner which manage to establish a joint venture with the national operator will win immediatly the control over the more interesting part of the system - the international calls controlled by Marconi, Portugal - and does it supported by two governments, the one of its own country and the Portuguese government. On the other hand, once the control of international calls is controlled by the external partner, this can avoid the development of niche markets and influence the policy for future acquisitions. Furthermore, the conditions imposed by external partners can be already defined.

1. The existence of specific IS policies on the part of Chambers of Commerce or similar commercial representative associations. Please tick the most appropriate statement(s) in the case of your country.

No discernible Plans Exists

Vague Plans but Unwritten

Plans only for Certain Sectors (specify)  ✓

Plans only in certain areas (specify)
There are some studies with important policy recommendations.

- One, presented in November 1992, is about the Telecommunications Industry in Portugal, which objectives are: to obtain a better understanding of the resources and capabilities of the Portuguese Industry; to analyse the potentialities and development trends of the industry, paying special attention to its insertion in the international context; and finally to propose and define implementation strategies of a development policy for the industry in the scope of PITIE/PEDIP.

- Another, also presented in November 1992, is about the Software and Information Services in Portugal, and aims to identify and recommend Government policies, programs and measures to improve Portuguese software and information systems industry.

Some other sectors are developing strategic plans that often include some reference to the use of information technologies. Nevertheless, there is not specific plans for IS policies on the part of Chambers of Commerce.

2. Pilot actions funded or part funded by the private sector. Can you give any relevant examples below, detailing in each case:

The funded programs are only the ones introduced by the government. As far as we know, there are no pilot actions funded by the private sector. Only SONAE group, from the distribution sector, which is struggling for the introduction of EDI among their partners, gives some technical support and advice during configuration and launching of the solution. This includes some on-job training an can be considered as an indirect funding to their partners.

3. At Central Government level, confirm whether an Explicit plan address developing the IS (or widespread advanced telecommunications use)?

There are many entities responsible for IS related policies:

- The "Instituto de Informática" (II) is the consultative member of all the government decisions concerning computer related technologies. National security measures related to computers have been approved with the collaboration of II. They also have been consulted when the government approved legislation concerning databases including citizen personal data. II is the entity in charge of the divulgation an application of the IT on the Public Administration.

- ICP (Instituto das Comunicações de Portugal) is the public entity which regulates the telecommunication services and providers in Portugal.

- The entity with the responsibility for approval and publishing of the standards, including computer and telecommunication standards, and certification of products
and entities is IPQ (Instituto Português da Qualidade). IPQ has delegate his responsibility in IT standardisation in II.

- There are also sectorial entities, like (IAPMEI - Instituto de Apoio às Pequenas e Médias Empresas Industriais), which works specifically with SME, and approves requests for European programmes like PEDIP, supporting several small company projects on Information Technologies.

- In this group of sectorial entities we can include SIBS (Sociedade Interbancária de Serviços) specially constituted by the banking sector to define and implement a policy of communication between all banks. This is a private organisation, but has an important role in the definition of the IS plans for the banking sector.

As far as we know there is no global plan for IS, or if there is one it is not available.

There are some sectorial plans, like the ones for the Public Administration or banking sector, but they are specific of these sectors and are not broadly divulged.

Table 11: The existence of clear sectoral plans to develop IS

<table>
<thead>
<tr>
<th>Clear Plan and Certain Actions to Develop IS</th>
<th>Some Consciousness of the need to plan but limited practical evidence</th>
<th>Little evidence of any consciousness of the need to plan or of actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
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<tr>
<td>1</td>
<td>*</td>
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<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Could you note any discernible differences in the above between indigenous and institutional sectors?

Institutional sectors do have more plans but less effective actions. Indigenous sectors can have more effective actions but it is not possible to get a global image.

Between regions?

There are some regions, like Aveiro and Madeira, which developed interesting actions. In Aveiro, pushed by the university, a system was created to connect, through the use of advanced communications, the university, local authorities, associations and firms. Madeira managed to be directly connected to an atlantic node and would have in the near future good connections with South Africa, Europe an America.
Table 12: The existence of clear public plans to develop IS

<table>
<thead>
<tr>
<th>Public Admin.</th>
<th>Clear Plan and Certain Actions to Develop IS</th>
<th>Some Consciousness of the need to plan but limited practical evidence</th>
<th>Little evidence of any consciousness of the need to plan or of actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Transport</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Social Welfare</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Education</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
</tbody>
</table>

Could you note any discernible differences in the above between regions?

The differences between regions can be more explained by differences in skills and attitudes than to physical access to central regions. Because public institutions, like municipalities, hospitals and universities are reasonably spread along the territory it is possible to find some skills and attitudes in less central areas.

LEVEL OF MEDIA INTEREST

Table 13: IS related specialised magazines

<table>
<thead>
<tr>
<th>Title</th>
<th>Subject Matter</th>
<th>Circulation</th>
<th>Units</th>
<th>Launch Date</th>
<th>Imported</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMUNICAÇÕES</td>
<td>Its the official publication of the Portuguese Society for the Development of Communications</td>
<td>Bimonthly</td>
<td>14000</td>
<td>10 years</td>
<td>national</td>
</tr>
<tr>
<td>REVISTA PORTUGUESA DE TELECOMUNICAÇÕES</td>
<td>Covering the aspects of public services and telecommunications</td>
<td>Bimonthly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REDES</td>
<td>Covers the telecommunication world with emphasis for the national market.</td>
<td>Monthly</td>
<td>15000</td>
<td>1 year</td>
<td>national</td>
</tr>
<tr>
<td>CORREIO INFORMÁTICO</td>
<td>Informatics. Dedicated essentially to the national market.</td>
<td>Fortnightly</td>
<td>7000</td>
<td>9 years</td>
<td>national</td>
</tr>
<tr>
<td>SEMANA INFORMÁTICA</td>
<td>Informatics. News coming from Informálique and PC Week.</td>
<td>Weekly</td>
<td>6000</td>
<td>6 years</td>
<td>international</td>
</tr>
<tr>
<td>CEREBRO</td>
<td>Informatics. Rich in tests an comparisons between software an hardware products</td>
<td>Monthly</td>
<td>10000</td>
<td>2</td>
<td>national</td>
</tr>
<tr>
<td>GUIA DO COMPUTADOR</td>
<td>Informatics. Small publication comparing only prices of hardware and software</td>
<td>Monthly</td>
<td>20000</td>
<td>2</td>
<td>national</td>
</tr>
<tr>
<td>PC MAGAZINE</td>
<td>Portuguese version of PC Magazine</td>
<td>Monthly</td>
<td>15000</td>
<td>5</td>
<td>international</td>
</tr>
<tr>
<td>PC WORLD</td>
<td>Portuguese version of PC World</td>
<td>Monthly</td>
<td>15000</td>
<td>8</td>
<td>international</td>
</tr>
</tbody>
</table>

5. Taking 3 or 4 largest circulation papers nationally, is there extensive coverage of the IS?

Are there regular sections on IS related issues in these newspapers? which ones?

Only one daily newspaper ("Publico": 75000 units), which sells around 75000 numbers has recently regular sections on IS related issues mainly pushed by one or two journalists and usually reporting experiences held outside the country. Futhermore, the more diffused weekly magazine ("Expresso": 150000 units) often has internal advertising brochures talking about new IT products but there are not many comments about their usage and effectiveness.
Have there been recent special sections in the papers on the IS related issues?

Most of the news and reports referring somehow to IS issues focus the privatization process of the Telecoms company, which first phase will occur on June 1995.

6. In relation to the G7 Summit (February 95) and the publication of the Bangemann Report (May 94), please indicate, for each of the three top newspapers and two top magazines, in the 5 days before, on the day, and 5 days after the event:

How many columns inches were devoted directly to the issue?

Searching the main weekly newspapers ("Expresso": 150000 units edited and "Independente": 135000) on May 1994 and February 1995 there is not any news referring either to the Bangemann report in 1994 or to the G7 meeting in 1995. This, albeit the European Parliament elections held in 1994 with large interviews with the main candidates. Nevertheless in the main daily newspaper ("Público": 75000 units) there was some news concerning the G7 Ministerial Conference in Brussels (all of them in the economic section):

25 February 1995

"Seven Discuss Revolution" 26cm x 29cm + 34cm x 4cm

"The new European challenge" 12cm x 30.5cm + 8cm x 6cm + 4cm x 34cm

"Portuguese Contrasts, Barriers of costs and regulation" 21.5cm x 6cm + 34cm x 4cm

"The Information Highways, Myth, Fashion or Reality?" 12cm x 31cm + 8cm x 15cm

26 February 1995

"G7 debate Information Highways
USA promise to eliminate barriers 24cm x 14cm
Information Highways" 4cm x 9cm

27 February 1995

"Ministerial Conference about the Information Society
G7 Project goes to the Expo 98 4cm x 8.5cm + 20cm x 14cm
From the Newsstand Multimedia to the Football Robot" 8cm x 23.5cm + 8cm x 8cm

Concerning the Bangemann report there is just a reference on the 10 December 1994 with the title:

"Joint Project of Europe, US and Japan for the Information Society
New technologies of conciliation" 16cm x 28.5cm
Notice that, the Bangemann report and the launching of the Information Society debate within the European Union was seen in Portugal as a mechanism used by external telecommunication companies to enter in Portugal leading, eventually, to the dismantling of the public provider of telecommunication, Telecom Portugal.

II Part : Synthesis of the Questionnaire

1. ACCESS

Do people, groups and organisations potentially have access to the IS infrastructure, if they so choose?

Although the development of telecommunications infrastructures in Portugal have been somehow impressive in the last ten years, there are still some areas of the country which cannot have access to the IS infrastructure namely those infrastructures which are experiencing increasing demands. For example, some remote areas in the mainland and the Azores islands have no access to digital mobile telephony and if there is a take-off in ISDN subscriptions certainly large areas of the country would be inaccessible.

ISSUE 2. QUESTIONS ON USER AFFORDABILITY

Is the cost higher in cohesion regions to use Information Society Services than elsewhere, both relatively and absolutely?

Yes, comparing the cost of a basket of entrepreneurial telephone calls for different countries it is proved that, in terms of purchasing power parity, telephone costs in Portugal are three times higher than in Denmark, 50% higher than in the UK and 10% higher than in Spain and Italy. Furthermore, because there is only some degree of competition in international calls, the price of these calls is decreasing while domestic prices are rising since 1991; also to increase the value of the public provider and facilitate the revenue from the privatisation process.

ISSUE 3. QUESTIONS UNDER EXTENSION OF USAGE

Among those who do have access, what is the extend of integration into the information society?

Interestingly there are some unexpected facts that show that the diffusion of information technologies does not necessarily take a core-periphery path: on the one hand, Cable TV began firstly in the islands of Azores and Madeira, where the need to get outside news and the adaptability of cable technology to concentrated urban areas help the creation of a success story; on the other hand, due to the competition between two main providers, digital mobile telephony is growing fast in Portugal and in 1993 got a diffusion rate higher than in Spain, France, Belgium and Greece in Europe.
Other services does not seem to have much success like videotext and videoconferencing either because there are many substitutes or because it was not possible to reach a minimum sustainable level (30000 with videotext). Telecom Portugal does not tell much about advanced telephone services but it is recognised that they are not very much diffused]

ISSUE 4 QUESTIONS OF EFFECTIVENESS OF USAGE

[Is the type of use made of IS services optimising benefit to the cohesion regions and groups?

Most of the adoption and use of IS services is pushed either by the competition, as happens in the financial sector, or by big suppliers and or customers. Therefore it is not a question of optimising the benefit to the cohesion regions and groups but, instead, to stay alive within an environment of increasing competition. Furthermore, because we are dealing with a reaction and not an action, most of the IS services adopted are already design by others; a nice exception is the financial system designed by SIBS (Sociedade Interbancária de Serviços] for the banking sector using, somehow, the specificities of the Portuguese financial system.

ISSUE 5. INVOLVEMENT IN INFORMATION SOCIETY PRODUCTION ACTIVITIES

[How involved is the member state in the production activities of IS itself]

ISSUE 6 QUESTIONS ON THE PRESENCE OF PREREQUISITES

[Are there nontechnical prerequisites present to a lesser extent than in other regions?

Only a few small companies invest for themselves. Most of them are only interested in advanced services if they are funded and introduced in sectorial programs. This has the benefit of decreasing the investment and to associate a group of companies with the same interests or business. Most Portuguese companies use low level technologies and have no aptitude to adopt and use information technologies.]

ISSUE 7 QUESTIONS POLICY AND LEVEL OF PUBLIC DEBATE

[Is there a coherent, adequately, supported, public policy towards the IS?

In Portugal the public debate more related with the Information Society focus the process of liberalisation telecommunications and the privatisation of the public suppliers of telecommunication services. There are some sectorial plans, like the ones for the Public Administration or banking sector, but they are specific of these sectors and are not broadly divulged. The differences between regions can be more explained by differences in skills and attitudes than to physical access to central regions.]
ANEXO 2

RESPOSTA AO QUESTIONÁRIO
DA EQUIPA CENTRAL

Framework Document for the Description of the
Portuguese Situation and Plans in the Field of
Telecommunications Regulation
Study Assessing the Social and Economic Cohesion Aspects of the Development of an Information Society in Europe : Phase III - Part 1

Framework Document for the description of the portuguese situation and plans in the field of telecommunications regulation

François Paumier-Bianco

1 - General regulatory situation

1.1 - Following Community guidelines, the portuguese government has proceeded with important reforms of regulatory aspects in telecommunications (TLC) sector over the last few years.

This reform which follows the principles of the '87 Green Paper is founded on the law no 88/89 of 11th September ("Lei de bases") which implies the liberalisation of a part of the TLC sector.

The law makes a distinction between public services and non public services, and establishes the limits of the public monopoly.

1.2 - At the moment there is a monopoly on public infrastructure and fixed voiced telephony. The public service consists of fixed voice telephony, telex and one packet switched data service.

Otherwise, the public infrastructure should be operate up to private operadores/providers due to te ONP principle, which has been adopted by portuguese law.

The market was geographically divided between 3 public TO's. 2 of them have been already merged. The monopoly is shared by 2 TO's : Portugal Telecom (PT) for national and european communications and Companhia Portuguesa Radio Marconi for intercontinental communications.

These TO's are concessionary for the public service of TLC. However, Marconi should become an affiliated company of the PT group (see point 2).
1.3 - Provision of the public service of TLC continues to be considered as the responsibility of the State. The State accomplishes this directly or indirectly through one public or even private firm by means of a contract of concession. Private activity is not permitted for the public services.

In the other hand, the other TLC services are opened up to competition; note that these services can also operate/provide by the OT (in the case of the mobile phone, the PT was authorized to operate the service in spite of the legal obligation to be licenced through a public tender).

1.4 - These services are subject to a regime of licencing or authorization in order to respect the "essential requirement" (integrity and security of the network, interoperability, protection of users and consumers):
- The VAS are subject to a simple authorization (regulated by the Law n°329/90 of 23th of April);
- The operating services are subject to authorizations or licences preceded by a public tender (for example, in the case of the mobile).
Access to this type of activity is controlled by the ICP (RA, see point 4).

The operadores and the providers of services are subject to the users right of secrecy of communication, to the continuity and quality of the service and to make prices known.

A great number of new services now exists -which were not available before 1989- these are provides in the context of competition : VAS based on voice telephony, X25 services, paging, trunking, mobile telephony etc.

It should be noted that PT operate/provide most of the above services, namely through affiliated firms (for example, mobile phone, paging).

1.5 - There is a principle of freedom of acquisition and installation of the terminal equipment. It is the responsibility of the ICP to give approval to TLC terminal equipment, as well to define the norms and technical specifications of materials and equipments for connection to the public network.

We can say that users now have more choice. However, the approval process generally takes time and for this reason the market for terminal equipment is not as dynamic as it could be (for example, the ICP has given approval for very few cordless phones [for fixed services] and this only recently).

1.6 - In general terms, one can say that TLC sector is subject to several well-defined principles: the principle of public service, of competition, of separation of the activity itself and its regulation, and of ONP.

Moreover the process of privatisation is under way (see point 2) and the obligations of PT have been redefined, taking into consideration the Universal service (see point 5).
1.7 - Tariffs of communication are being redefined step by step. The tendency is to increase local and regional calls and to decrease international and long distance calls (see point 4). We can say that the reaction of the portuguese public to the former increase has been negative. In general terms prices have been decreased.

In the other hand there are some difficulties in implementing itemized phone bills. This is particularly problematic in the case of VAS and the consumers association have drawn attention to and protested about this.

Conclusion : The key force retarding the liberalisation process is the dominant position of PT. Apart from the reserved services the market is more competitive in all aspects (see for example the mobile sector pont 3) although still dominated by the PT group (it operates in many branches, even in the cable TV sector).

2 - Privatization

2.1 - A law for partial privatization was adopted in 1995 (no.44/95 of 22th February). Privatisation of 28% of PT will effectively begin from the beginning of May.

This law has 2 objectives:
- To reduce the weight of the public intervention in the TLC sector
- To strengthen the PT company in the international arena.

2.2 - This process is the result of several years of restructuring of public firms in the TLC sector: the separation of the postal and TLC activities; the transformation of the public company to a private company; the creation of the "Comunicações Nacionais" (CN) which is a public Holding managing the participation of the State in the communication companies.

The role of this Holding is to facilitate the merger and the privatization of the public operators. PT is the result of the merger between Telecom Portugal, Telephone de Lisboa e Porto and Teledifusão de Portugal. PT will absorb Marconi.

2.3 - So far a strategic partner for PT has not been found. On the other hand the law emphasizes the importance of the participation of the citizen and of national economic groups for privatization, as the company is closely linked to the public interest.

In spite of this privatization process, the State does not intend to lose control of the company. It is clear that the state aims to maintain a balance between public interest and maximization of profits.
3 - Mobiles operators

3.1 - In Portugal mobile services are operated on the open market. However, a licence is necessary to operate this kind of service.

Law n°346/90 of 3rd November establishes the conditions for operating these mobile services. In addition to this law each type of service has a specific regulation (one for mobile phone, one for paging, etc.). Moreover, licences contain more specific obligations for each operator.

3.2 - At the moment there are 2 Mobile telephony operators in existence:
- TMN which is part of the PT group. TMN operates one analogical service and one GSM service, with different coverage depending on the material used (2 or 8 w. terminal, see map n°1);

- Telecel which was licenced after a public tender (Telecel is a consortium of various national groups. 25% of its capital is in the hands of foreign companies). Telecel only operates one GSM service (see map n°2).

The two companies provide a service at national level with an ever increasing coverage. The aim is to have complete coverage which is near realisation except for the administrative regions (Madeira and the Azores).

The operators are obliged to:
- Fit and promote interlinking with the fixed network/service;
- Publish information about zones of coverage and guarantee a continuous service in these zones;
- Promote access to pan-European services and guarantee a European roaming;
- Guarantee equality of access;
- Guarantee inclusion in the telephone directory, respect the users right of secrecy of communication, guarantee free access to the emergency services provided by PT;
- Publish tariffs and prices of elements.

According to the operators, at the end of 1994, each one has more than 100,000 subscribers.

There is suggestion of licencing of a 3rd mobile phone operator, although no decision as yet been taken.

3.3 - In the area of paging 4 operators have been licenced. These licences are for national coverage (4 regional licences were proposed but without success). All the operators belong to national group such as PT or Finacom (see the map n°3 for the coverage of one of these operators).

The operators of paging are subject to the same type of obligation as the mobile telephony operators.
3.4 - There are 2 operators of Trunking (Radiomóvel and Repart). Their objective, in the final place, is to provide national coverage (except for remote inland parts). For example one of these operators should cover 70% of the continental territory by the end of 1995 (this does not include the autonomous regions - Madeira and the Azores).

The operators of trunking are subject to the same type of obligation as the mobile telephony operators.

3.5 - In Madeira and in the Azores there is a specific mobile service of multiple use (mobile phone and trunking mixed technology), provided by 2 operators.

Conclusion
Decisions to open/provide new services not yet in existence and to licence new operators of existing services is at the discretion of the government. So far government has used its discretion positively, allowing great dynamism of the mobile market.

4 - The form and structure of the regulatory agency

4.1 - In 1989, the ICP (Instituto das Comunicações de Portugal) was created for the regulation and control of the sector of TLC (in reality, the ICP was created in 1981 but began functioning in 1989; Law n° 283/89 of 23th of August). It functions under the authority of the Ministry of Public works, Transport and Communications.

The ICP is a public institute with a juridical character, administrative and financial autonomy and it has its own premises.

4.2 - Its functions are as follows:
- To help and to collaborate with the portuguese government in defining the policy in the TLC sector and to elaborate projects of law and regulation in this sector;
- To help the government to coordinate, control and plan public TLC;
- To manage the radioelectric spectrum and to allocate frequencies

- To represent Portugal in the international organisation (for example, Intelsat or Eutelsat);
- To authorize and licence operators and providers for new services;
- To ensure that obligations and rules applying to operators and providers are respected;
- To control quality and prices of services.
- To give approval to materials and terminal equipment;

4.3 - The members of its administrative board are appointed by the Council of Ministers. The ICP is independent of the public operator and juridically distinct from the State.
However, in spite of satisfying European demands in this matter (see the Commission directive 90/388, art. n°7), its independence in practice could be dubious. In fact, PT has a representative in the ICP Consultative Council and the State, in one hand, has the administrative supervision of the ICP and, in the other hand, as the most important shareholder it will have the control of PT.

This situation could lead to problems for the application of the ONP principle, and later in the case of competition between PT and other operators or in a case of process to grant operating licence for new services.

4.4 - The administrative Regions have a limited role and only one representative in the Consultative Council of the ICP (one each for Madeira and the Azores - the only administrative Regions in Portugal).

The Users/consumers have a limited role too, with only one representative in the Consultative Council of the ICP.

4.5 - The ICP participates in the establishment of the prices of the public service of TLC (the other operators are at liberty to establish their own prices). Prices of the public services are agreed upon an annual convention between the ICP, PT (as public operator) and the competition department of the Ministry of economy and finances.

At the moment these entities take the following 3 factors into consideration to define prices: inflation, real costs of communications and the necessary social function of voice telephony and of the other public services. In fact, prices have not increased since 1993, namely for voice telephony and for leased lines. Effectively, then, they have decreased.

In addition, the public operators have introduced cheaper rates for off-peak hours. For example, Marconi has 3 different periods for intercontinental calls: super-economic, economic and normal (PT has 2 periods for national and European calls). For intercontinental calls Marconi has gradually decreased its prices over past five years by 42%.

5 - The new licence for the incumbent operator

5.1 - PT is concessionary of Public service of TLC. Since February the company has obtained a new contract with the State which is valid for a period of 30 years (law nº 40/95 of 15th of February).

The concessionary is obliged to operate the following services:
- Fixed voice telephony
- Telex and telegraph
- Packet switched data service (Which is provided by Telepac a PT affiliated group company)
- Leased lines service
The concessionary also has to establish, to manage and to commercialize networks capacities included in the public network.

5.2 - PT is subject to the principle of ONP, secrecy of communications, continuity and quality of services, and provision of some services free of charge.

5.3 - PT has to operate/provide these services in terms of Universal Service. The Universal service is defined by the law as follows:

Satisfaction of the needs of communication of the population and economic activities throughout the national territory, in term of equality, continuity and fairness of prices. The requirement of economic development and social harmony and balance should be taken into account (art. n°1/o of the law). In addition to these general obligations, each type of public service has specific obligations:

In the case of fixed voice telephony (art. 10)
- To guarantee equality of service independent of persons and geographical location (throughout the national territory, even for the administrative regions);
- To take into account groups of citizens will special needs (the handicapped economically underprivileged groups - retired persons and pensioners);
- To guarantee/insure a high standard of quality of service and technical capacity.

A convention between ICP and PT will be made every 3 years with the following objectives: Development of the network with annual target relating to minimum provision of services, advanced services and standard of quality.

In the case of infrastructure (art. 21)
- The objectives are essentially the same as for fixed voice telephony, particularly for the standards of quality and the target for installation.

5.4 - Note that the cost of the universal service will be compensated (art. 25) probably in 2 ways:

- A deduction in the rental which is paid to the State by PT;
- Tariff practices according to the European guidelines (directives?) in this matter.

5.5 - Prices should be reoriented by the real costs of the services, demonstrated by an analytical account system. We may assume that this policy of rebalancing of tariffs will continue.

6 - Licences for new fixed link operators
At the moment, no other operator is licenced to provide fixed voice telephony. The cable operators (an area which is totally dominated by the PT group) cannot, as yet, provide any kind of telephonic services (nor can any other network operator, such as electricity, gas or railroad companies).

Officially there is no plan an no perspective to change the situation. Theoretically, Portugal can maintain the monopoly on fixed voice telephony until 2003.

"Free trade zones" do not exist in Portugal in TLC sector.

7 - First assessment of the cohesion issues associated with liberalisation

As Portugal is a small country, geographical coverage by the TLC services is satisfactory (even by the private services). Nevertheless, there is a potential risk of the private providers/operators limiting themselves to urban areas and the costal strip (more densely populated and wealthier). Liberalisation could accentuate this phenomenon for returns on investment. For this reason it is necessary to have a uniform Universal Service with advanced characteristics. Provision of this service should be guaranteed, for example, to the SME inland. In the other hand, the private providers must be subjected to national coverage.

In my opinion the opening up of the fixed voice telephony market to other operators will not necessarily lead to an improvement for these peripheral zones, as long as PT fulfils its Universal Service obligations in terms of quantitative and qualitative objectives in these zones. The same remark is valid for the Packet switched data services. The Universal service, as currently defined, should be sufficient for the essential necessities in the domain of the information society and should guarantee a good level of social cohesion in spite of the gap between urban and inland zones.

8 - Some data statistics (ICP - 1995)

The total n° of phone (10^3)
1987 : 1655,3
1989 : 2077,6
1991 : 3014,2
1994 : 3444,3

Density : phone/100 inhabitants
1987 : 16,7
1989 : 21,0
1991: 27.4
1994: 34.9

The total n° of public phone
1987: 20.9
1989: 23.7
1991: 28.4
1994: 32.6

Density: public phone/1000 inhabitants
1987: 2.1
1989: 2.4
1991: 2.8
1994: 3.3

Waiting list to have access to the fixed voice telephony (10^3/request)
1987: 141
1989: 227
1991: 208
1992: 132
1993: 63
1994: 17

Medium delay to have the fixed voice telephony service (1 month)
1987: 9
1989: 10
1991: 7
1992: 4
1993: 2
1994: 0.64

% of the digitalisation of the local commutation
1987: n.d.
1988: 2
1989: 14
1990: 30
1991: 45
1992: 54
1993: 59
1994: 62

Kilometers of fibre-optic cable
1990: 3950
1991 : 8881
1992 : 13251
1993 : 32988