

Diversity and the digital economy as drivers of the new economy in the European periphery

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Delivered at the 'Where in the World?' Conference, Budapest 24/25 October 2000

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1. Introduction

It is claimed that we are entering a period of profound economic change comparable to the industrial revolution. Yet there is a lack of clarity about the nature of this change. Discussion of economic development increasingly tends to fragment at a time when integrated multi-disciplinarity is the *sine qua non* of regional development. The new approach leads to demonstrating how lifelong learning relates to the need for the enterprise to constantly adapt, while entrepreneurialism, networking and partnership formation or clustering tend to be discussed separately by reference to the need to promote flexible innovation. Similarly discussion of the emergence of the Information Society lacks discussion of the associated social change. Few of these discussions give a clear understanding of the specifics of the economic transformation writ large. Above all there is a need for a discussion of the nature of the New Economy, the dynamics of its emergence and the implications for socio-economic development in Wales.

These comments might appear misplaced given all of the discussion about Objective 1 and how the associated cash input will transform those regions which can benefit from it. Yet that discussion tends to focus upon the orthodox understanding of economic development [**onid dipyn o non sequitor yma yn yr ystyr er mae yn nhermau chwyddaint isel (etc.) y synnir am bolisi economaidd yn gyffredinol, a fod hyn yn scir yn y cefndir wrth drafod datblygiad rhanbarthol, nid dyma sydd flaenaf wrth drafod datblygiad o'r fath – a dyma wrthrych y paragraff...**] a with its focus upon state monetary and financial policy to promote low inflation and to establish monetary constraints on public borrowing. What is good for the UK is good for Wales (Welsh Office, 1997). The various 'strategic priorities' are precisely that, priorities devoid of an understanding of what it is that they will create.

The claim of a shift to an information society suggests that the entire discussion is rooted in an outmoded problematic. The modernist conception of the economy was premised upon the centrality of the state as that which imposed order on economic activity. There was a single economy and a single labour market for each state. This was coupled with the view of the economy as an organic entity whose parts existed in an adaptive harmony, and of the economic actor as a rational being whose behaviour was driven by the quest for optimisation. Sociology shared this orientation by reference to society, leading to an idealised conception of industrial society that paralleled the concern of Economics with the industrial economy.

It is increasingly argued that economics, and especially regional economics, is failing to give answers to crucial questions, leading to a tendency to fall back on intangible and inoperable concepts such as 'the feel good factor'. Arguments about the rigidity of the Maastricht Treaty and its relationship to unemployment reflect how Keynesianism argued that a [**Maddau fy**

nhwpdra, ond dydw'i dal ddim yn deall beth mae hyn yn ei olygu. Ail-wampio = high tax on unemployment involved a rigid structuralism of the economy.] Simultaneously it is held that the market should operate at will. The shift from macroeconomics to microeconomics, involves a focus upon the logic and coordination of individual choice and the idealist conception of the market wherein the state respects the rule of play and allows the economy to stabilise to the extent that involuntary unemployment is reduced to a minimum (Williams and Morris, 2000). The combination of telematics and intellectual investment means that most of the costs of an enterprise occur at the stage where the process of production is put in place. Thus the system functions by reference to fixed global costs, i.e. with unitary costs decreasing in relation to the volume of production. **[Mae'n rhaid bod gwell i fynegi hyn. Beth am y fersiwn a awgrymais i'r tro diwethaf?** That which is produced is no longer the combined factors of production, but of integrated structures, capital and work, confounded in such a way that one can no longer distinguish the productivity of one from the other.] The net result is that the notion of marginal costs on which economic calculation is based loses all significance. **[Ystyr??** = Information is, above all, a 'relation' which develops structures in the form of networks and interdependencies, as much between firms as between these firms and their distinctive cultural and socio-cultural environments (Morin, 1999).] **[Ystyr??** = Production becomes a collective good linked to the effective functioning of a collection of elements which flow over into the strictly economic field.]

Such changes have several consequences:

- **[Mae'n rhaid bod gwell i fynegi hyn. Beth am y fersiwn a awgrymais i'r tro diwethaf?** The market ceases to be a regulator where the producer seeks to exceed a reduced price that derives from expanded competition by reducing cost price through expanding production.]
- **[Mae'n rhaid bod gwell i fynegi hyn. Mae o'n parhau yn gwbl niwlog i mi!** When the notion of the specific productivity of a factor is associated with the nature of the collective goods of the state, the distributive field of commutative justice, involving revenue compensating for the contribution of each one to production, is displaced by distributive justice, where a common good is distributed between all. This leads to the definition of new criterion.]
- International exchange is less and less an exchange between states but involves trans national companies **[Mae'n rhaid bod gwell i fynegi hyn. Beth am y fersiwn a awgrymais i'r tro diwethaf?** operating with themselves with little reference to location.] The same states are both the importers and exporters of the same goods. The old theories of factor emolument or of comparative advantage are in retreat.

Clearly there is room to rethink at least some of the orthodoxies of Economics.

The interdependence and openness of the international economy, means states and **[Tydi hwn ddim yn derm cyfarwydd (i mi o leiaf). Onid yw 'supra state bodies' yn fwy cywir? Dim ond yr UE a ellid fyth ei weld yn nhermau uwch-wladwriaeth, yn ol unrhyw ddealltwriaeth 'arferol' o wladwriaeth]** supra states must become engaged in fostering development strategies on behalf of their economic constituencies. Since key factors such as monetary policy interest rates, or technological innovation are highly dependent on global movements, traditional economic policies organised within the boundaries of regulated national economies are increasingly ineffective. If states and supra states want to increase the

wealth and power of their nations, they must enter the arena of global competition, steering their policies towards enhancing the collective competitiveness of firms under their jurisdiction, as well as the quality of the production factors in their territory. Deregulation, and privatisation may be elements of a development strategy, but their impact on economic growth will depend on the actual content of these measures, and on their link to strategies of positive intervention, such as technological and educational policies that will enhance the informational production factors of the country. [Ystyr?? = To some extent, the New Economy (NE), based upon socio-economic restructuring and technological revolution, will be through political processes played out in and by the state/supra state.] Enterprises will increasingly resort to networking as the basis for the constant rearrangement of their operations. New business models will be developed, models which insist upon flexibility as a central principle, especially by reference to shifting markets. [Tydi hwn ddim yn gywir fel mae'n sefyll. Beth am y fersiwn a awgrymais i'r tro diwethaf? Networks are particularly appropriate instruments for a capitalist economy based upon innovative, globalisation, and decentralised concentration.] They suit the needs of workers, work and firms premised on flexibility and adaptability; of a culture of endless deconstruction and reconstruction. The polity must also be flexible in responding to needs and expectations, rather than merely implementing service provision as a manifestation of policy to a passive consumer.

There is a need to discuss the nature of the New Economy (NE), the Digital Economy (DE) and the transformation of the Old Economy (OE). If the NE is seen to be the basis for faster and broader income growth, then it seems clear that the first step involves a careful overview of the centrality of the DE in the transformation of the OE. [be yd'r dilyniant yma??>This may mean that both the DE and the NE must be both developed within any particular region.] On the other hand the DE may exist outside of a region and plays a central role in developing the NE within that region. I want to argue that it is those regions or trans regional partnerships which can develop the entire value chain of the DE within their own regions which are most likely to succeed:

- in entering the information society with a competitive advantage;
- in transforming the OE into the NE quickest, thereby avoiding the danger of becoming the source of displaced labour for the NE;
- in benefiting from the exploitation of its own resources for its own use, and also from outsourcing them to other regions within the global market place.

This means that we should treat the DE and the NE as involving two different, but related, processes. The DE transforms raw materials into digital products that can be marketed, that can be transformed into new products and which can serve as the basis for developing new services. The NE is the consequence of how the OE is transformed and involves the reproduction of existing enterprises and the production of new ones. The remnants of the OE becomes the source of displaced labour for the NE. Evidently there is a hierarchy of structural forms associated with this schema.

2 . What is the New Economy?

This question has been answered not via an appeal to theory, but rather, by an inductive, descriptive process whereby the characteristics of the NE serve as the basis for defining what it is. The various indicators which have been developed tell us more about the dynamics of

change than about the causes of change. Causality tends to be retrospective and focuses upon revolutionary technological advances, including powerful personal computers, high speed telecommunications and the Internet. Useful though this may be, it does little to help us understand the dynamics whereby the economy operates.

The nature of the NE is also described in terms of what it is not. It is contrasted to the manufacturing emphasis of the Modernist economy. It also refers to the organisational components of the economy being contrasted with the hierarchical organisation which focused upon Taylorism and Fordism etc. Thus the NE becomes a term that refers to the qualitative and quantitative changes which have transformed the structure, functioning, and rules of the economy. It involves a shift towards knowledge and idea based activities where the ideas and a technology that are embedded in both service provision and manufacturing are the key to job creation and an increase in GDP. The NE is also described as an economy based rapid structural reorganisation involving flexibility, risk and uncertainty. The idea of churn and flux replaces the former understanding of the labour market as involving fixed relationships between employer and employee within the context of a planned economy. This rapid process of restructuring is not entirely dependent upon structural transformation, but has its own dynamism. Jobs are constantly being created and destroyed, and even the concept of 'company' gives way to the idea of individuals operating across a range of activities in a highly volatile labour market. Survivors tend to be the innovative and the efficient. Of necessity, if the structure of the economy changes, then so does the occupational structure. We conclude that the driving force for these structural alignments is the relationship between innovation and technology, leading to the danger of causality being linked to a technological determinism associated with the rise of the significance of information communication technology (ICT).

The claim that innovation and technology generates the NE ignores the issue of agency. This is resolved by resorting to the concept of entrepreneurialism.. It seems that the criticisms of the 1970s are being ignored, and that we are once again locked in the discussion of entrepreneurialism as the transcendental saviour of the economy. The current focus upon entrepreneurship in the rhetoric that surrounds the Objective 1 initiative in Wales gives room for concern. The term tends to be used without reference to much understanding of what is involved, the process whereby it operates, nor the danger which is involved in relying upon it as a central concept for the development process. It leads to simplistic accounts of development and what is required to promote it. Its absence, or perceived absence, leads to a blaming of the victim, whether that victim is an individual or the collective force of the population of Wales.

Entrepreneurialism is regarded as individual behaviour which is heavily imbued with the willingness to adopt high risk strategies in developing projects which, while they have a large possibility of failure, also carry the potential for considerable reward,. The current climate of economic transformation based around relatively cheap technology would appear to be ideally suited for such developments. On the other hand the insistence that the NE is far removed from individualism and rests heavily upon collaboration and communitarianism (Touraine, 1997) highlights the contradiction associated with linking entrepreneurialism and the network economy. Risk behaviour is most readily adopted where there is a strong guarantee against failure, or where there is sufficient reserve available to withstand the potential loss (Williams, 1976). If this is not the case, then risk behaviour becomes irrational. Indeed, if we treat economic behaviour as rational behaviour, then entrepreneurial activity without such

guarantees would not appear to conform with the optimal goal seeking principles of theories of economic behaviour.*

There is also a contradiction in the manner in which the relationship between entrepreneurialism and culture on the one hand, and innovation and culture on the other are currently discussed. The former remains fixed on the tendency to relate entrepreneurial behaviour to cultural values which are also normative values. That is, there is no room for any economic behaviour which is associated with non-normative culture. Yet it is axiomatic that innovation is non-normative. The argument remains firmly embedded in the sense of an abstract figure operating within the neo classical framework. Even Schumpeter's (1949) treatment of the concept relied upon the Modernist conception of society as an evolving organism that was constantly in search of equilibrium within the drive for inevitable progress. Given that this progress was premised upon the normative structure of western culture, the entrepreneur could only exist within this cultural context. In contrast, the claim for a relationship between innovation and culture pertains to the relevance of language for the social construction of meaning. It argues that the divergent ways in which linguistic and discursive form constructs meaning leads to viewing diversity as the very cornerstone of innovation. Innovation becomes the way in which different subjects and objects are constituted and reconstituted in and through language. Evidently, the two arguments are opposed. Where one tolerates and praises cultural and linguistic diversity, the other abhors it.

The concept of innovation avoids many of these problems. It focuses upon the concept of enterprise as the reordering of established ways of doing things. There is the need to divorce this concept of enterprise from the activity of individualised entrepreneurs who derive their capacity of enterprise from non-economic factors such as their cultural background. This cultural component becomes the link between the individual and the wider social order. The focus on individuals as decision makers runs counter to so many of the principles of the NE that it can only lead to confusion. It is inconceivable that individuals can operate in a vacuum to achieve the kind of economic transformation that is required to transform the OE into the NE. Failure to take heed of such obvious issues will merely lead to a headlong search for risk motivated individuals, and for the diacritica of the associated behaviour such as some vague psychological 'need for achievement' which are claimed to mark this 'type' of individual, the same ground that was already covered unsuccessfully in the 1960s. The risk of psychological reductionism which uses a psychological variable to explain a sociological phenomenon involving the transformation of one type of society to another is clear.

Moving to a consideration of business development we encounter the concept of cooptition associated with the claim that innovation and value are more commonly generated in networks. Companies in competition can also co-operate. The social capital or shared norms and mutual trust essential for generating value added partnerships is fostered in collaboration and alliances. Innovation and cooptition go hand in hand.

According to this understanding of the relationship between the NE and raising GDP, Traditional Industrial Age rationales and goals of regional development must give way to new ones. The challenge shifts from job creation, controlling inflation and managing the business cycle, to creating a progressive economic policy framework that will encourage per capita

* Relying on entrepreneurialism to inform Objective 1 strategies for west Wales and the Valleys would appear to be foolhardy at best.

income growth. In the Old Economy, fixed assets, financing and labour were the main sources of competitive advantage for firms. This led to an emphasis in regional development on physical infrastructure for start up factories, gap financing for big industrial projects and marketing and incentives to attract industry. This low cost industrial recruitment strategy, involving cutting taxes and services to make a location attractive, is not the path to raising GDP. Cutting costs in order to provide low wage jobs is no solution. In the new global economy, where there is increased competition and the use of technology, the risk of inflation is reduced. In Europe the reduction of state regulation and the shift of policy to a new, European, level is part of this process. Economic policy shifts to focus upon supporting and fostering continuous adaptation through high innovation and technology focused practices. Thus the focus in the drive to the NE is in the direction of rapid indigenous growth through transformation, rather than on business relocation. The US experience suggests that regions which have relied upon primary resources, or upon their ability to attract inward investment through low wages and subsidies, have been the slowest in transforming into New Economies. The earlier emphasis on low costs, the abundance of skilled labour and a transportation infrastructure and regional incentives, gives way to how effective public policy can spur technological innovation and the willingness of people to grasp the challenge afforded by the new technology. Thus, it requires investment in education, specialist skills enhancement and skill transferability as well as the transition from bureaucratic hierarchies to learning networks.

3. The Digital Economy:

If the NE is poorly thought through, this is even more so by reference to the DE. It involves a claim that an increasing share of economic value is a product of electronic means, mainly as a consequence of the drastic reduction in computing and telecommunications costs. ICT increases efficiency, cuts costs, drives the customisation of products and services and increases the speed of commerce. There is also the claim that the goal of this development is to provide the technological facilities that allow e-commerce to prosper. 'Digital' pertains to electronic resources rather than to a clear understanding of the impact of digitalisation upon economic activities and production. There is an obvious need to distinguish between the Electronic Economy and the DE. The former pertains to the way in which the NE relies upon electronic means for the operation of its practices. The later refers to the range of activities associated with the digital value chain. These activities are locked into the kind of inter relationship that leads to transforming raw materials into marketable products, and also involves the means for marketing them.

The DE is more than the provision of content for convergent media. There is a need for each region to consider the entire digital value chain and how it can help to transform its OE into the NE. This claim rests on an awareness of the relevance of digital resources for a range of areas that are going to be central to our future activities – from learning to entertainment. There is an urgent need to produce the various digital resources that pertain to any region. The digital value chain involves a relationship linked to the development of its structure within networks and interdependencies. Thus, each firm enters the chain with its own diverse natural or socio cultural environment and, in one way or another, production becomes a collective exercise linked to the effective functioning of human elements which largely spill over into the strictly economic field. What I am arguing is that we need to view the DE as an economy in its own right, with its own dynamic, and its own processes. That is, it should not be seen as something which pertains to specific sectors, but as something which constructs its own

sectors of diverse economic activities, each with its own relevance, but within an essential interdependence. This begs the question of the relationship between the DE and the rest of the economy. Here, once again I would distinguish between the OE and the NE, the later consisting of those activities which depend upon the use of electronic resources linked to specific relations of production in facilitating entry into a global market. Conceptually this kind of threefold division is not unlike the concept of the Articulation of Modes of Production (Wolpe, 1979), or the manner in which Dependency Theory theorised the relationship between the formal and the informal economy (Quijano, 1974).

Within the DE, the relevant value chain consists of a series of linked activities beginning with the digitalisation of raw materials and ending with the marketing procedures (Fig. 1). It involves the following processes:

- The digitalisation of resources, whether this involves the transformation of analogue audio visual materials, the photographing of historical documents or other materials.
- The storage of these resources under the right conditions for their preservation.
- The development of multi media rights clearance (MMPR) issues which will allow owners of the resources to work together to develop a warehouse or a Distributed Archive of digital materials which are available under use agreements that cover the entire holdings.
- The watermarking of these resources so that they can be transported, viewed and purchased.
- The development of resource locators which can search, find and identify the resources, and which can also identify the conditions under which they can be used.
- The development of an appropriate transportation system, whether this involves the web or satellite.
- The development of an appropriate payment method.
- The transformation of these commodified resources into new marketable products.

This sequence of activities are what are necessary in developing the NE through:

- The use of these products in transforming the OE.
- The structuring of on-line learning in relation to the ability to exploit these resources.
- The marketing of these products via the internet.

Each of the above points has its own value chain and there is an urgent need to analyse these in order to uncover the 'digital steps' in Wales must be taken for entry into the entire value chain. What is implied in this conception is that the NE depends upon the products and services generated by the DE. The activities of the NE may well be the same as those of the OE, but the manner in which it conducts those activities will be drastically different. The consequences for the NE is that they enter a global market and they speed up all of their transactions. Some of the products of the DE e.g. digital Library images which previously gathered dust assume a new value within the NE.

Clearly, this variety of activities involves a range of related projects if the concept of a regional DE is to reach fruition. It is already beginning to take shape, albeit as a series of loosely related activities. What is now necessary is a discussion of the details of how the

different components of the digital value chain identified above can be assembled in order to facilitate the elaboration of the DE within Wales.

As with any raw materials within the traditional industrial age economy, resources have value within the DE once they are transformed into digital resources. Thus, the first step of the value chain involves the commodification of resources through digitalisation. The import system responsible for digitisation also involves compression and pre-documentation leading to a full documentation processes. These resources become raw materials which can then be sold across and within regions. However, for that value to accrue, the means whereby they can be transported and sold must exist.

The goal is the amalgamation of the different digital resources into a digital warehouse or Distributed Audio-Visual Archive, readily accessible to anyone. This means that a series of processes are necessary before such an objective can be achieved. The first of these processes pertains to developing MMRC. This means that the various holders of digital resources be it the National Library, the National Museum or S4C must come to agreement about the terms on which they are willing to allow their resources to become part of the archive, and the terms on which they will make these resources available for different uses. This in turn involves compiling a register of these resources as a basis for indexing. That is, content without information about it is worthless or, even worse, simply accumulates storage and management costs without realising any return. In a sense we are discussing the creation of a massive National Digital Archive of Wales. The content only becomes an asset when it is linked with copyright clearance. Clearly this is one of the aspects which demands co-operation which covers the triangular value relationship between media, data and rights which lies at the heart of effective digital asset management. There must also be inter operability between media formats and systems, and the potential of automatic exchange of meta data across archives.

Indexing for these materials and the associated documentation system supports advanced material analysis, the interpretation of analysis results as well as efficient indexing. The meta data which represents the information that is gathered must be capable of delivering information about individual segments as well as trains of materials such as video sequences. It must also contain the relevant MMRC information. Most importantly, it must conform with the emerging standards that will allow different archives to link with one another, and for different users to articulate with materials from diverse archives. The template manager provides templates for different formats – newscast edition, cinema magazine, fictional series, historical documentation etc. It involves segmenting programmes at various levels to strict rules that are incorporated in the meta data which must describe content at various levels of annotation by embedding descriptive and identifying information in the video, audio or textual file as electronic meta data. It provides the link between business information and media technology by reference to user needs.

Retrieval and browsing pertains to the way in which the end user is able to obtain access to the materials, scrutinise them, and decide on their use or rejection. Such intuitive browsing is available over high-speed networks and the Internet. Users must be capable of using complex or standard keyword queries based on image, audio or video features. Advanced graphical user interfaces allow the documentor to validate or correct in producing the final annotation of the material.

The combination of intellectual property and media data provides everything required for delivery and recycling of the media asset. What is further required is the means of distribution

and the on-line automated royalty payment procedures. There is little doubt that, as the technology improves and becomes universally available to the extent that high resolution is widely available, the means of distribution will focus upon high speed distribution via the internet and other high speed wide area connections including digital subscriber loops, broadband fibre optics, cable television networks and next generation wireless networks. Watermarking not only protects copyright, but also facilitates the transition to on-line payment in line with the more orthodox developments of e-commerce. Speed is of the essence in all of these developments and associated transactions.

Finally there is the need to transform this vision of media asset management and the development of a digital value chain into concrete business and technical strategies. This must encompass the value of the various resources as regional resources without excluding regional enterprises from using these resources on cost effective terms. This must consider the divergent scaleable use of the commodities, both geographically and also by reference to different use sectors such as education or the regional media/multimedia sector. Such issues will derive from the MMRC work. There is little doubt that the development of the value chain will lead to efficiency savings, better cost control of rights, added value to the viewer and listener, and support for commercial transactions as appropriate. Whereas the digital resources become commodities which can be marketed as a feature of the NE, the further work which can be undertaken on these resources in generating new products is a feature of the DE.

4. Applications:

Having outlined the process whereby the Digital Value Chain must be developed, it remains to discuss how it can become a process wherein digital products are transformed into marketable commodities, and how it can feed into transforming the OE into the NE. That is, I see the DE as an economic process, and also as a feature of the servicing of the remainder of the economy. In the first instance it involves developing digital products which become part of the NE, whereas in the second, it involves developing the tools which facilitate the electronic economy to operate with both digital and non-digital products, this function constituting the DE.

Given that we are discussing the articulation of three different economic components, with the DE as the driving force of transformation in the other two, there is a need to consider the relationship between them. The tendency for modernist economics to conceive of the economy as a structured whole, with the different parts of that whole existing in harmonious coexistence has been problematic for the discipline in its attempt to come to terms with internal variation. The DE supplies the NE with resources which are derivatives of the digital value chain. These can be educational multimedia software, interactive television products, the tools with which to activate e-commerce or materials that feed the leisure industry. It is these resources which link with the organisational structure of the NE in helping to create new products, and also to further adapt. The DE also transforms the OE into the NE. This process involves companies in the OE engaging with the use value of the digital chain in using those resources, while simultaneously transforming its operational practices in order to be able to draw down that value through interaction with other aspects of the NE. That is, for companies in the OE to enter the NE there must be a compatibility of operation and organisation for it to succeed. If this is not in place, then the OE is articulated with the NE in a subordinate relationship as downgraded labour.

Part of the definition of the NE rests on its organisational structure. Yet it is conceivable that companies in the DE will not have such a structure. Conversely it is possible that regional companies within the NE will derive their technology from outside of the region rather from the regional DE. Clearly, if we are to avoid the kind of dependency which Wales has experienced in a different spatio-temporal context it is advisable to insure that the structures are in place for both the NE and the DE to develop in tandem. This is largely the role of the state. It might even be desirable to insure that the DE and the NE overlap.

In focusing upon the Digital Value Chain it should be clear that the driving force behind the development of the DE is the digitisation of resources. Equally important in a discussion of ICT and its impact upon economic activity is the issue of the convergence of modes of transmission, most specifically the internet, terrestrial and satellite broadcasting, and telephony. It is the link between digitisation and this convergence that is driving the NE. The integration and convergence of various modes of communication, information processing and media into an interactive network is breaking down the cultural and technological barriers that have separated the world of broadcasting, publishing, communication and information technology. For the first time it integrates the written, oral and audio-visual modalities of human communication into the same system. The potential integration of text, images and sounds in the same system, interacting from multiple points, in chosen time (real or delayed) along a global network, in conditions of open and affordable access, changes the character of communication.

It is tempting to see the benefits of these developments as accruing to what is referred to as the 'New Media'. However, rather than thinking of this development in terms of the restructuring of existing activities it seems profitable to think of it as new activity that involves the merging of a number of diverse economic activities from broadcasting through software development to design and advertising. The neat arrangements of the diverse sectors of the OE are thrown into disarray, this being one reason for considering the merging of diverse economic activities as constituting the DE. One of the reasons for the focus on the 'New Media' is the importance of content provision for the future activities of the DE. Convergence will inform choice and there is likely to be a massive surge in content needs which must feed into any emerging business models. However, it is already evident that the existing business models for broadcasting are outmoded. The convergence paradigm obliges the emergence of new models constructed out of the new broadcasting and the associated multimedia sector. New means of collaboration are essential, and these must be associated with the creation of new technologies which pertain to high value content. Already states are making plans to introduce legislation involving the third generation of telephony and the Wireless Application Protocol. It is likely that the new regulation will involve setting up franchises to promote public/private partnerships for mobile telephony and to ensure that competition prevails over monopolies.

The emphasis on content provision as a potential growth industry derives from the new conception of publishing and broadcasting. It is becoming widely recognised that it is around such activities that the DE will grow. It is also claimed that much of the content will derive from the particularism of cultural heritage leading to '...the culturalisation of the market and the "marketisation" of culture.' (n.a. 1999). In integrating the different activities which will constitute the DE, existing media company skills must be made transferable. These skills must be articulated with those of the analogous activities. The importance of such

developments lies in the fact that many of the digital resources which can be brought into play derive from the media sector of the OE. These resources can allow the multimedia activities of the DE to enter the market with a distinctive cost advantage over those entering from computing or publishing. The existing media sector and its contribution to the National Archive is central to indigenous growth linked to the DE.

These activities clearly lie within the DE, using digital resources to generate products as part of the digital value chain. Yet the development of this capacity also leads to the ability to generate the capacity for enterprises located in the OE to become part of the NE. This is partly a function of how the enterprises in the DE service the NE. It is here that we need to consider how the New Economy is premised upon the use of ICT, leading to entirely new conceptions and processes of production, involving new relations of production. It is important to recognise that the NE is a services, high-tec and offices economy. Digital resources will contribute to the creation of new systems based entirely upon the use of ICT. These will range from the obvious fields of learning, e-commerce and service provision, to the more obscure activities of community development as a virtual interactive process.

Digital resources will play a central role in most of the factors which are of relevance to the NE as it develops. I have already indicated that much of the definition of the NE focuses upon the manner in which enterprise organisation and management is structured in such a way that the enterprise can take advantage of the high speed of the new technology. This involves transforming companies into Learning Companies. This concept is based upon the manner in which ICT allows learning to focus upon reflexivity as opposed to knowledge. The goal of learning becomes that of allowing everyone to develop the reflexivity that allows them to understand why things are done the way that they are leading to addressing the learning needs of employees by reference to the new conditions of flexibility, flat management and other productive processes which currently inform work within the NE. This will involve just in time or, better still, just in case learning for all employees. The emphasis is on collaborative learning resources which regional learning practitioners will pool for project learning which is problem based and which will lead to new products based around collaborative working and learning. The means whereby these learning architectures are developed will be provided by the DE.

Above I have argued that the openness and interdependence of the international economy means that governmental bodies must play a central role in the NE. That is, policy promotes innovation and customer oriented government. This means that the polity must become more flexible and responsive, partly on account of how electronic means generate productivity and income gains while also increasing the quality and cutting the cost of government services. More significantly perhaps it involves how the shift of responsibility and accountability from the state to the individual and the community obliges a re-evaluation of service provision. Services are no longer the provision of policy to passive recipients or consumers but must rely on dialogue within which consumers actively formulate policy. . Service provision becomes a process based upon meeting the needs and expectations of the citizen. This requires a dialogue between provider and end-user. This awareness encompasses a vast array of services which transcend space in a way hitherto unimaginable. Interactivity will be at the heart of these developments. They will be constructed out of the interoperability of digital sites, and the transformation of democracy from one based entirely around the conception of representation, to one which accommodates participation (Williams, In Press). In transforming itself Government into a flexible and responsive system also has the capacity to

accelerate the development of the DE and also the relationship of the citizen to the NE. (6332)

5. Implementation:

My argument is premised upon the claim that regional development must be based upon the transformation of the OE into the NE, and that the DE is the means whereby this transformation occurs. Having argued that the NE involves an organisational structure which emphasises the importance of networking and flexible organisation, how it relies upon digital products and the high speed of the new technology, and how it demands a new orientation to learning I would now like to consider how a regional development that is informed by the significance of ICT and the DE can be put in place. First of all however, there is a need to confront the current danger of regional development becoming synonymous with business development. Strategies premised upon business development may well generate successful business without resolving the structural problems of peripheralism. There is a need to develop the means whereby community, business and regional development go hand in hand. The new technology makes this possible. Business development requires the capacity to restructure and to network; communities require the means whereby they can interact on the basis of their corporate strength in developing links with other communities; and regional development requires the means whereby regional integration can occur within and across sectors or economic activities.

The task is one of using the benefits of the new technology to develop the means whereby the three kinds of developments integrate while also insuring that the requisite transformation occurs. The concept which does serve this purpose is that of value added partnerships which involve networking of partners in a flexible manner so that businesses or communities can come together for some functions while retaining their independence and autonomy. Such partnerships rely on two fundamental attributes - a strong sense of mutual respect and the constant flow of information across the partnership. They are highly effective in exploiting the flexibility that is necessary in order to be able to respond to the rapidity of change in market demand. They can also be highly efficient means of integrating the different links of the digital value chain. If the networks of these value added partnerships are centrifugal by reference to the region then they also serve to integrate the region both within the different sectors and across them. It is here that I envisage the strategic articulation of firms with the DE in promoting the NE.

The technology which facilitates the implementation of these networks is based on the use of ICT to develop what is known as intranets. The linking of companies on-line allows them all to be able to communicate quickly and effectively, to access the Media Asset managing System and Service that is integral to the DE, to access information as knowledge with ease and rapidity, to access learning architectures and to work collaboratively. Intranets become the ICT based systems around which the activities which transform companies and production in a strategic way. The question that now emerges is one of how to exploit this technology to achieve the desired goal. That is, it is essential to keep the goal of development at the forefront while asking how the technology can best serve that need. Technology is driven by developmental needs and not vice versa. It is also essential to recognise that since technology serves social and cultural needs considerable attention must be given to promoting the communities which use the technology. This should be evident from the emphasis which I have placed on the relevance of mutual respect for value added partnerships.

The use of intranets as the architecture which supports a virtual learning environment should overlap with the concept of networking for product development. That is learning becomes focused upon learning by doing. This is particularly relevant to the emergence of the DE. I have already suggested that the enterprises which operate with the Media Asset Management System in exploiting the digital resources involve a range of activities. Each of these activities involves skills which are essential for the development of the digital economy. It is by pooling them that the DE will develop. This pooling involves a learning environment for everyone involved. It therefore involves collaborative learning environments using the shared resources derived from the Media Asset Management System for the development of marketable commodities. Learning and production go hand in hand, and learning becomes part of daily operation. Clearly learning loses its formal context and there is the very real danger that those who have traditionally taken charge of delivering education to the community - FE and HE institutions - will be left out of the learning equation as it develops.

In a sense the concept of cooptition thrives on such technology networks in that the partnerships can transcend allegiance to the individual company. It is the kind of environment that characterises churn and flux and the emergence of gazelle companies - fast growing companies or partnerships which thrive on economic dynamism and competition. The exchange of experience and knowledge within the network promotes innovation and it is the speed of innovation and the ability to enter the market quickly which are the determinants of competitive advantage within the global economy. (7190)

6. Trans regionality:

The shift of regulatory function from the state to Europe, and the development of globalisation makes it evident that no region should consider its development without reference to other regions. One of the dangers of the Objective 1 initiative is that it will lead to an excessive concern with Wales' regional economy without reference to its articulation with rest of the European economy, and the emerging global economy. Such narrow conceptions can only exacerbate existing problems in that while it might strengthen the internal structures, it will fail to exploit the advantages of such integration outside of its own terms of reference. Other European regions and European Programmes must be kept firmly in sight.

There is another reason for emphasising trans regional integration. I have argued that the development of the DE partly hinges on the emerging importance of culturally related content provision for convergent systems. The EC argues that no single region has sufficient diversity of such resources to satisfy the market. This means that regional cooperation is essential. Furthermore, such cooperation expands the market while also facilitating entry into the global market. Other regions are developing their digital value chains. What is required is a coherence within this development. Thus the development of Media Asset Management Systems must involve conformity with European metadata standards so that trans regional archives can be developed. Similarly the MMRC systems must be compatible across the regions. The EC is taking steps to insure that development proceeds along these lines. If it succeeds there is no reason why the intranets which serve the development of the DE alongside the digital value chain cannot operate trans regionally. Certainly interoperability is essential and intranets must become capable of being transformed into extranets. Markets will be expanded for the resultant products.

Such a conception involves shared information and the means whereby the need for mutual confidence that are so necessary for successful value added partnerships can transcend space and cultural difference. One step in this direction involves the development of company data bases whereby companies in one region can target partners in other regions in developing trans regional partnerships. This is aligned with explanations of the economy as a socio-cultural system that will allow company information to be contextualised. Once again the intranet is more than adequate to serve such a function.

One of the factors that will limit markets for the products of the DE is language. Thus human language technology must become an integral feature of the digital value chain. This will facilitate the automatic translation of cultural resources and products, making them relevant for a range of markets segmented by language and culture. It can also facilitate discussion within the trans regional operational partnerships. In a global economy based on diversity such a development is essential.

The text of this presentation appears in the December 2000 issue of *Contemporary Wales*.