

Digital Business Ecosystem

Contract n° 507953

Workpackage WP33: Communication and constituency building

Deliverable D33.10: Media Information Pack



Information Society
Technologies

Project funded by the European Community under the "Information Society Technology" Programme

Contract Number: 507953

Project Acronym: DBE

Title: Digital Business Ecosystem

Deliverable N°: D33.10

Due date: 05/2006

Delivery Date: 05/2006

Short Description:

Content for an online press centre as part of the DBE public web site.

Author: LSE

Partners contributed: LSE, Intel

Made available to: Public

VERSIONING

VERSION	DATE	AUTHOR, ORGANISATION
1.0	31/05/2006	NEIL RATHBONE, LSE

Quality check


1st Internal Reviewer: Mary Darking, LSE

2nd Internal Reviewer: Anne English, Intel

3rd Internal Reviewer:



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Introduction - The DBE Website Press Room

The purpose of this document is to deliver the content for an online media information facility that will form part of the DBE public web site. While this introduction describes the deliverable, the sections that follow are the actual content that will appear. As some of the content is references, links, or proposed items, these are indicated in [square brackets].

There are specific challenges in communicating the DBE via the media. The DBE is a new and complex concept, which is not easy to explain, even for those who are familiar with it. This difficulty is amplified in the case of the media who have to explain it ‘second hand’ having first absorbed the information themselves.

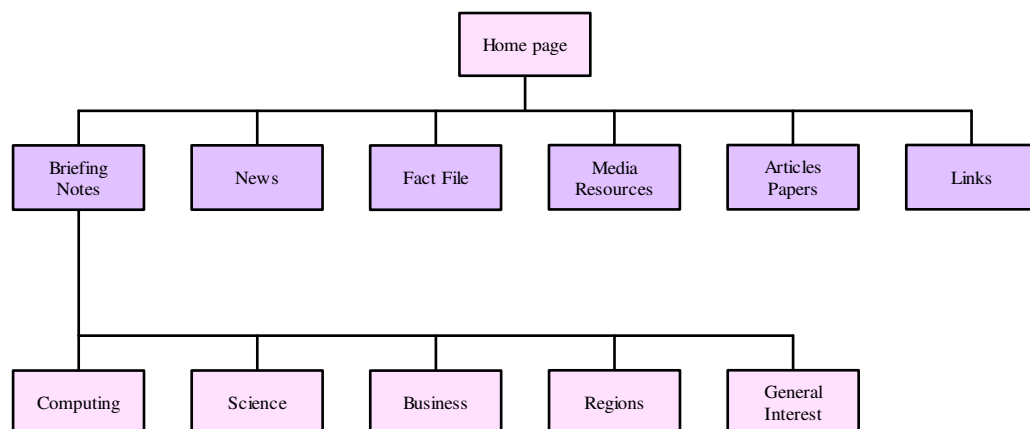
In addition, the DBE has multiple aspects that require individual explanation. This is multiplied by a wide set of disparate audiences that range from the general public’s interest in the future of the Internet, through the business and economic development communities, to specialist audiences such as the OSS community and scientific researchers in specific fields.

Added to these challenges is the uncertainty inherent in any project of research and technological development. This means that plans, outcomes, and even the semantics that underpin descriptions may change as the project progresses in a way that compounds the difficulty of clear and understandable communication.

Our answer to these challenges has been to limit media comment until the project is reasonably well advanced and stable, and to provide the media with a dedicated ‘press room’ which caters for their specific needs. The title ‘Press Room’ was chosen over more descriptively correct possibilities like ‘media centre’ as it is a well-understood term for a space where the media go to get information.

Structure of the Media Centre

The Media Centre or 'Press Room' is a mini-site with an introductory home page and a number of sub-pages. Key to the facility are the briefing notes, which have been designed to appeal to particular sections of the media. It is the content of these pages that forms the main body of this deliverable.



Home page(s)

Welcome to the Digital Business Ecosystems (DBE) online press room. Here we try to supplement the DBE web site by providing media information on the various aspects of the DBE tailored for subject-specialist journalists. If you are new to the DBE we suggest starting with the briefing notes for editors. If you require further information please use the contacts list on the briefing notes page.

What is a Digital Business Ecosystem (DBE)?

The Information and Communications Technology (ICT) revolution is far from over. Despite the dramatic way the Internet has changed our world, as yet we use it mostly to connect together systems that were designed for yesterday's world of stand-alone computers.

For businesses and economic development, ICT is now recognised as a fundamental competitive element. Encouraging ICT adoption forms a major plank of many areas of European policies and programmes. However, such initiatives cannot assume that ICT is static. Coming over the horizon is a new wave of radically different systems - 'digital ecosystems' - in which the Internet is assumed right from the start. Such systems do away with the need for controlled central servers, even with the need to know or to plan the system at all. At the heart of these new 'digital ecosystems' is a type of operating platform that is designed and built to be distributed across the Internet rather than to reside on any one computer.

Just as computer programming has progressed to higher and higher languages, to the point where software creates program code for us and we can think of functions in terms of 'objects', so the digital ecosystem goes to a higher level still. The DBE's service oriented Model Driven Architecture enables you to specify a model of your real world business, combine it with other services and expose your business to a whole new market. Compatibility of software is assured at the model level, no matter what the code behind it is.

Another important new element is Open Source Software. Open Source means that, unlike proprietary systems, users can see the source code and how it works, use and adapt the software and integrate it into legacy or new products. It levels the software playing field again, by preventing a repeat of the global monopoly that was established in PC operating systems. The DBE platform is both Open Source and free, governed by the Creative Commons License (<http://creativecommons.org/licenses/by-nc-sa/2.5/>) . This does not prevent developers charging for their efforts, but such software draws its resources from a large community of developers, who form 'communities of practice' – each enjoying the benefits of free, open source software and, in the reciprocity that is integral to these communities, each contributing back in some way to its development.

But Digital Ecosystems is a far broader concept than a new bit of software and new ways of creating it. A system like the Internet, with its myriad of independent actors, soon starts to become an organism in itself: something that is more than the sum of its individual parts. Underpinned by a distributed operating system the possibility now exists to do things to and with the 'system' that no human could ever program into a machine.

Like ants exhibiting collective behaviour as a colony rather than as individuals, there is a whole new world of social and quasi-biological mechanisms that can develop, or be deliberately introduced, into this complex maze of independent actors and their interactions. Cut free from their PC-based operating systems, limiting our Internet usage to accessing information, sending messages, and remotely operating services, digital ecosystem users are empowered to offer complex services across the Internet and to participate in individual transactions and public markets with ease, in ways that to date would have challenged a multinational's IT department.

Why 'business' ecosystem?

Like any platform, including the Internet itself, digital ecosystems do not directly bring end user applications. Systems are built up of layers that do specific parts of the task and so the layers all have to be created before a single end-user can benefit from the technical capabilities. The Digital Business Ecosystem focuses on using the digital ecosystem concept to bring a usable business-specific platform into existence. Even so, development is still needed to make individual end-user applications, so the DBE involves a network of developers to produce the 'killer applications' that the users see and which run on the DBE platform.

There is wide consensus that business is the area that could gain most effectively and most quickly from the use of digital ecosystems. The many processes that go on within a company, plus the complex web of business inter-relationships in our economy, mean that the business world is able to reap the benefits of digital ecosystems to improve their competitiveness. Just as ICT adoption in business is now acknowledged worldwide as an essential element of economic performance, so the effective use of digital business ecosystems will in future become a major plank of economic development.

[The following section is designed to appear as an inset on the home page]

DBE in a nutshell

The Digital Business Ecosystem (DBE) is first and foremost a concept: the concept that businesses could reap huge advantages if they were able to operate their processes within an Internet-based 'ecosystem' - a space where individual organisms interact with each other and their environment.

The name 'Digital Business Ecosystem' also refers to a European project that has turned the concept into reality by providing a software platform on which systems developers can build real ecosystems for various purposes.

The DBE is unique in its approach to the ecosystem concept. First, the platform is free and Open Source, providing a non-proprietary public asset. This sets it apart from legacy-based proprietary models from big software vendors like Microsoft and SAP. The DBE also has an 'Evolutionary Environment' in which phenomena such as optimisation and self-organisation are adapted from natural ecosystems and made available to DBE-based systems.

In practice, the DBE technology is intended as a powerful regional economic development tool for supporting and developing SMEs in an increasingly global marketplace. Just as the Internet has provided a new public asset, the DBE provides a public platform that harnesses the real capabilities of the Internet for business users.

Notes for editors

The sections below present subject-specific information for journalists and editors on specific aspects of the DBE.

The science behind DBE
The DBE software platform
Business impact / Benefits of DBE
DBE in regional economic development
DBE news and general interest

Latest news:

[Ticker or news content from elsewhere in site? (events etc.)]

Contacts:

Subject	Contact	Email
Project Manager	Andrea Nicolai	a.nicolai@t-6.it
Research	Paolo Dini	P.Dini@lse.ac.uk
Computing	Miguel Vidal	miguel.vidal@sun.com
Business	Elmar Husmann	ehusmann@mac.com
Regional Catalysts	Javier Val	jval@ita.es
Media information	Neil Rathbone	neil.rathbone@daventryhouse.com

The DBE software platform

A briefing note for editors

Basics

The DBE software is a middleware platform on which software developers and their end-user clients can build and run applications. The DBE is unique and leading-edge in several ways: it is a fully decentralised or distributed IP-based P2P operating system with no single point of failure; it allows developers to work at the level of business logic; code is reusable and interoperable due to the high level structured and semantically rich modelling language; and it has an integrated development toolkit. Most importantly it allows the users to create ecosystems, either within private networks or, more importantly, across the Internet. This allows P2P interaction within a closed system, or in a public ‘common land’, or between ecosystems.

The main DBE features are:

- Free, Open Source, fully distributed operating environment
- Service-Oriented Model-Driven P2P Architecture
- Integrated development environment with semantic B2B service descriptions
- Availability of DBE core services (e.g. accountancy)
- Access to leading edge scientific developments in digital ecosystems via the Evolutionary Environment

Model-Driven Architecture

At the heart of the DBE are the fast-emerging architectural approaches of Model-Driven Architecture (MDA) and Service-Oriented Architecture (SOA). These represent a logical step forwards from object-oriented design and Web services to business and domain modelling at a higher level of abstraction with a semantically rich language. The meta-models thus produced will not only make system creation more efficient but will also be more interoperable, more easily re-used in similar business situations, and will survive generations of their implementation languages.

As well being entirely independent of any particular language or hardware platform, for the DBE a model-driven approach provides a common conceptual structure so that unrelated software elements can interact among themselves and with the ecosystem without having to be ‘compatible’. Following the international MDA standards of the Object Modelling Group (OMG), the DBE is creating a specific Business Modelling Language to describe business processes and form the basis for DBE software design. This language is adopting the new OMG standard, Semantics of Business Vocabulary and Business Rules (SBVR).

In addition to the obvious direct advantages, MDA provides another important quality that is fundamental to the most exciting part of DBE. The structured and semantically rich

environment allows the incorporation of algorithms that emulate natural-world processes for self-organisation, self-optimisation and self-replication. This leading-edge science holds out the possibility of building complex ecosystems in which users' interactions with each other and with the ecosystem itself can cause change in the same way that a complex natural ecosystem changes. While the research is still at the early stages and the outcomes are not guaranteed, nor even fully understood, it will be a big step forward in systems design and engineering if we can use such science to improve systems in ways that are currently just not possible. We can already see that the public Internet has become more than just connecting computers. The social and economic mechanisms that are emerging lend themselves to self-evolution and the DBE scientists are looking for ways to drive this positively.

Free and Open Source

The DBE platform is entirely Free and Open Source, which is an important factor in giving smaller developers the ability to compete in the global market for business applications. Open Source gives developers and users some ownership and control over the code they rely on. By providing the platform for free, the cash investment for developers to move into digital ecosystems is eliminated, and the risk reduced.

Given the world's experience with monopolistic domination of PC-based software, and the temptation for big corporations to seek to dominate each new ICT development, it is a matter of public concern that the emergence of digital ecosystems will be a target for domination. By leading the next generation of software firmly down the Open Source route from the beginning DBE will help to prevent this.

Of course Open Source does not necessarily equal free, and the DBE will be very much a commercial environment, able to contain proprietary elements that may or may not be free and may or may not be Open Source. However, the ecosystem itself will be strictly Open Source and will encourage Open Source products as developers create specialised software elements that need to interact with other elements.

The platform in a nutshell

The Execution Environment (ExE) is the distributed DBE 'runtime' environment, while the Service Factory (also known as the Studio) is the collection of DBE development tools. The DBE platform also has some built-in core services.

The main features of the DBE technologies are:

Execution Environment (ExE):

- P2P architecture for Service Oriented Architectures (SOAs)
- Workflow Execution Engine
- Dynamic and distributed P2P architecture capable of supporting long-lived transactions
- P2P Distributed Semantic Registry for storing and discovering semantic descriptions of services and companies
- Service Recommender

Service Factory (SF):

- Composition Language Editor
- P2P Distributed Knowledge Base
- Ontology-based Knowledge management and semantic discovery of models
- Automated Testing Framework
- Business Modelling Language
- Service Description Language
- DBE Studio: a suite of editors for describing and creating services
- Interaction Design (for end user services)

DBE Core Services:

- Accounting service
- Distributed identity service
- Knowledge Base Service
- Semantic Registry Service
- Recommender Service
- Distributed Storage System

In addition, there is the Evolutionary Environment (EvE), where optimisation takes place using the latest scientific algorithms. This is described more fully in [The science behind DBE](#) [make a link]

Further reading:

[developer white paper & brochure]

The science behind DBE

A briefing note for editors

Basics

The DBE Project has an important scientific research objective, in addition to researching and developing the Digital Business Ecosystem as a practical ICT entity. The ‘science’ objective is to find ways in which phenomena from the natural and physical world can be usefully applied to a digital ecosystem. As digital ecosystems are the sum of many individual actors and actions with no owner or ‘grand design’, they should in theory be able to mimic natural world ecosystem processes such as self-optimisation, self-replication and self-organisation. The science strand of DBE is integrating computer science with physical and social sciences with the goal of creating a true ecosystem in which actors and environment interact.

As an ambitious research objective in an emerging field, the outcomes of the research cannot yet be precisely defined and fixed. The sources of real-world phenomena, coming from physics, mathematics, biology, and social sciences, present a bewildering array of possibilities. Turning these into useable algorithms is a serious challenge, and understanding how these might affect a digital ecosystem is a question of discovering, experimenting and then following promising pathways with a multi-disciplinary approach. Digital Ecosystems research will be a strong theme of the European Commission’s 7th Framework Programme for research, and is expected to gather worldwide interest over the coming decade as the economic and commercial possibilities of digital ecosystems are grasped, in particular as a way to improve the abilities of Small and Medium-sized Enterprises (SMEs) to compete in a global marketplace.

Science vision

In nature we see an array of physical, chemical, and biological processes that produce complex effects, from turbulence in air to the behaviours of ant colonies and the evolution of mankind through DNA. Our human social and economic behaviour also exhibits patterns and processes that have evolved and that serve us well, such as markets, group behaviours, hierarchies and language.

[Diagram of integration of physical/computer/social sciences]

It would be fanciful to imagine software, or a digital ecosystem, spontaneously ‘evolving’ from some digital form of primordial soup, but while many of the sophisticated mechanisms that allow biological systems to function have arrived through evolutionary processes over long periods of time, they do not rely today on evolutionary processes in order to function. So can we replicate these evolved phenomena in a digital space? If we can, will the ongoing interaction of organism and environment within this space create a slowly evolving ecosystem?

Central role of language

Computers are often viewed only as machines, but our use of computers today goes far beyond computational machines. ICT is central to facilitating interactions and the coordination of commitments to act. This human perspective highlights the connection of ICT to language and social process, a phenomenon that is seen today in the emergent uses of the Internet.

Once we realise that organisations can be understood as networks of commitments, it becomes easier to see how ICT can catalyse the formation of social structures. But if social structures define our world and ourselves, then language can be seen to carry a far-reaching power. Part of digital ecosystems research is about connecting communities of users to this constructive power. Here is where physical science, social science, language and ontology meet the various sciences of computing and ICT, especially ontology and model driven architectures.

EvE - where the science happens in the DBE

The DBE has to be a practical everyday tool for doing real business right from the start, rather than an experiment. The application of the 'science' objectives is envisaged largely as an off-line or non-real time parallel function that will not interfere with or be a precursor for business use of the DBE. This approach has led to the creation of the Evolutionary Environment (EvE). It is within this environment that the fruits of the science research will be available to users and that experiments will be carried out.

This separate area does not diminish the central importance of the evolutionary possibilities. Moving to and operating within a digital ecosystem demands some structure and discipline from developers and end users in order to adapt to a model-driven architecture. While the ICT itself brings some immediate advantages, the real golden prize that makes a digital ecosystem worthwhile is the possibility of killer functionalities that are as yet undreamed of in the world of ICT, and that will forever be impossible for a human to programme into a machine.

Current research activities

The methodology of Science research in the DBE is a mixture of different approaches and activities:

- incremental extensions of existing frameworks (i.e. the mathematics of evolutionary computation)
- bold, if reductive, attempts at modelling economic interactions between SMEs
- applications of biological design patterns to software engineering
- simulations of various aspects of network dynamics and evolutionary systems
- new mathematical and computer science ideas applied to formal languages (i.e. fitness function based on SBVR - Semantics of Business Vocabulary and Rules)
- implementation of the EvE

- investigations of new ideas in biology-inspired computer science (gene expression and code generation)
- the mathematics of signal propagation in static and dynamic network topologies

In all cases the research activities reflect the needs of the DBE, being based on and inspired by applications. As a consequence, the general flavour of science research is ‘bottom-up’ and opportunistic rather than arising from a single, ‘top-down’ unified vision.

Further reading:

Science vision

http://www.digital-ecosystem.org/Members/aenglishx/linkstofiles/deliverables/projectmanagement/Del_04.1_DBE_Science_Vision_Draft.pdf/download

http://www.digital-ecosystem.org/Members/aenglishx/linkstofiles/DBE_Science_Vision_V4.pdf/download

[Arturi di Corinto article ‘The new common land’]

Future research

http://www.digital-ecosystem.org/Members/aenglishx/linkstofiles/dbe_position_paper_vf.pdf/download

[Link to EvE movie]

Business impact of DBE

A briefing note for editors

Basics

As its name implies, the Digital Business Ecosystem (DBE) is an information technology system aimed at businesses. It is an entirely new platform, on which business applications can be built, that will help Small and Medium-Sized Enterprises (SMEs) to operate their business in new and more productive ways. In particular, it will help SMEs to make more effective use of the Internet as a means of linking together and interacting.

A key objective is to help small and micro enterprises, which currently tend to be disadvantaged by their size, to use ICT more effectively to join in and compete in the global marketplace. Fundamentally, the DBE should make it easier for small businesses to trade with each other and to act together in clusters without geographical boundaries.

In fact the DBE serves two distinct types of SMEs; those who develop software, and end users who employ software applications and services, or could employ them if they were more easily available.

Software developers

The DBE makes it easier for software houses to develop powerful business applications. Those applications are then more compatible, portable and re-usable so that greater value can be made of them. As the platform is free and Open Source, the developer has no up front investment in software and has access to the platform source code, which is vital in order to avoid being locked-in and driven by the technology vendors. Using the DBE platform, smaller software houses should be able to take on bigger and more sophisticated projects and be able to charge fees that are both economic and within the means of small companies.

The DBE aims to create a free and open community of users who will help each other in a way that has been shown to work in developing and maintaining Open Source Software such as Linux. The distributed nature of the DBE technology can also mean less investment in servers, back-up and disaster recovery systems.

The software sector is an important part of the economy. From time to time, new opportunities come along and it is often the first to capitalise that makes the killing as emerging technologies hit a critical mass and burst on the market. Digital Ecosystems is one such opportunity, having the potential to make the software sector, in particular its SME software developers, more innovative and competitive for some years to come.

End users

These are the real core objectives of the DBE. SMEs form 99% of enterprises and account for well over half of employment and GDP, as well as the vast majority of economic growth. As trading has generally become more global and fast-changing, SMEs have

tended to lose out to multi-national competitors that have the resources to use ICT more effectively and to market globally. The Internet has already helped SMEs by providing cheap global communication, but as yet has not been exploited to anything like its full potential to link company systems.

While the functionalities of the DBE can be applied to internal systems, it is mainly designed for external-facing systems that support the trading relationships between companies. In the same way that Peer-to-Peer (P2P) systems have first shaken and then revolutionised the media industry by enabling youngsters to share music and videos, so the DBE promises to be a disruptive technology that will allow SMEs around the globe to form alliances and clusters and operate in new integrated ways.

Systems will no longer have to be compatible and written individually. Model-driven architecture allows business processes to be defined using an understandable language that describes business logically. The meaning or semantics of that language becomes part of the system and is usable by other applications, no matter what system they are running on.

The DBE will allow businesses to find and interact with each other in ways that are either not possible or not economically viable today. It will be possible to form new kinds of product and service offerings, to trade in new ways, and to optimise processes so that the SME can do business effectively on a global scale. Just as the Internet has found its uses after it came into existence, so the DBE is a blank canvass waiting for SMEs to decide what they want to do with it.

As free and Open Source Software, the DBE will also release users from the current cost and complexity of PC-based software. In particular for very small firms it will allow them to cheaply and easily use specialist and bespoke software, which is normally only economically viable for larger firms.

Growing the user base

The DBE has already started with a handful of leading software developers that have been involved in the research and testing and have in turn recruited several hundred end users. These have been recruited and managed by regions that have either joined or associated themselves with the DBE due to its economic development potential.

The DBE Project, which is a European Commission project to establish the DBE, is at the same time researching and testing ways of involving SMEs in research and development. This involves:

- Design and implementation of training and engagement programmes
- Social network analysis of regional actors significant to ICT development
- Development of a taxonomy and knowledge base of trust and regulatory issues
- Socio-economic analysis of open source communities
- Development of use cases and business scenarios based on SME interactions

Further reading:

[Arturo di Corinto article 'DBE and the e-economy']

[Link to SME, policy makers, and technical movie]

DBE in regional economic development

A briefing note for editors

Basics

Regional economic development thinking has for some time recognised the importance of SMEs and of ICT. The Digital Business Ecosystem (DBE) links the two by providing the operating platform that can underpin a wide variety of ICT developments for SMEs, both individually and as part of a regional ICT strategy, in order to draw local companies into the next generation of Internet usage.

In addition, DBE is experimenting with innovative new ways of involving regions and SMEs in major multi-national research projects.

Good for Europe

Information and Communication Technology is a foundation for the knowledge society and an essential tool for the Lisbon objectives. The dominance of US companies like IBM and Microsoft and the early adoption of the Internet has shown that economic advantage comes from the vision and commitment to lead, rather than the 'wait and see' approach, followed by the 'me too' approach. As this new generation of Internet-based software technologies appears over the horizon, Europe must be first to embrace it in order to reap the benefits for future generations of citizens. The Digital Business Ecosystem is part of a family of European Digital Ecosystem projects that are developing the next generation of Internet software with European interests in mind.

Good for regions

In looking for an ICT strategy and interventions, regions are effectively in competition with each other. DBE enables regions to leapfrog conventional thinking by combining ICT adoption and literacy with 'next generation' business Internet usage. Most regions have at least a small number of tiny software development companies and these can form the basis for developing a regional plan that supports ICT from adoption and training, through infrastructure and connectivity, to end-user applications that can attract SMEs into effective ICT usage.

DBE gives the local software sector a toolkit to produce 'killer applications' specifically for businesses. It uses model driven architecture to underpin efficiency and re-usability and free/open source software principles to give the smallest developer the ability to compete at world-class level. The DBE will foster a community of open source developers, all able to use and contribute to the development of the technology. This community itself represents a market among developers who can inter-trade their products and expertise.

Good for the end user

Many of the major developments in ICT risk leaving small companies behind as not only the need for IT literacy grows, but also the level of literacy and resources required escalate. The DBE is designed to be free, and Open Source. This means low-cost and adaptable by local software developers. SMEs need no longer be at the mercy of the proprietary interests of major suppliers. It will enable applications to be developed locally that improve the competitiveness of SMEs in all sectors.

Although most end users may never be aware that an application uses the DBE platform, it provides functions that businesses, including SMEs, need both internally and in the external interrelationships with suppliers, customers, and peers that enable business to function. The availability of the DBE should lead to low-cost and adaptable software with a much greater degree of interoperability, ease of operation, and adaptability to legacy systems.

A regional opportunity

A growing number of regions from the EU and beyond are participating in the DBE and in related projects within the EU Framework programme's 'Digital Ecosystems' cluster.

DBE participants follow the same broad model that has been established in the project. Led by a 'Regional Catalyst' organisation, software 'drivers' who are enlightened to or excited by Open Source, Web services and P2P technologies are recruited to develop DBE applications for their end-user customers. In this way, a supply chain relationship is used to create the early applications and to disseminate the technology.

Many regions are including DBE participation in their Cohesion/Structural Funds programmes, which is a strategic priority of the European Commission in order to achieve complementarities between funding programmes. In addition, INCO and other international programmes are being used to link regions from various continents into Digital Ecosystems projects.

Further reading:

[Arturo di Corinto article 'Fostering Local Economies']

Regional contacts:

[list of regions and contacts]

[Link to SME and policy developers movies]

DBE news and general interest

A briefing note for editors

Basics

The Internet revolution is far from over. The Internet may connect the world, but it connects yesterday's applications, designed for yesterday's computing and yesterday's ways of doing business. The first developments that have been designed from the ground up with the Internet, rather than the PC, as the fundamental platform are only now emerging. Referred to as Digital Ecosystems, such platforms work in a way that is similar to the peer-to-peer software that caused such a furore in the music industry. The operating system, the software that determines how a computer system works and what it is capable of doing, is distributed among all the participants and operates across the Internet.

Rather than teenagers swapping music, the most critical use seen for this new software is business. The Digital Business Ecosystems (DBE) project aims to launch the first such platform. The way that business processes work, both internally in terms of planning and resource allocation, and more importantly, externally in terms of interrelationships with customers, suppliers, and partners, lends itself to such a distributed system. Compatibility problems between computer systems and the structure and logic of their applications have been a nightmare for companies large and small. These are overcome in the DBE by a 'modelling' approach. Each business uses concepts from a 'semantic registry' to build the exact system it wants by specifying a model of its processes. The connection is then done at the conceptual level rather than at the almost impossibly complex level of programmer's code. This is similar to the idea behind the 'semantic Web' in which conceptual and contextual information would be embodied in web pages such that a searching for 'penguin' does not produce an Antarctic bird alongside chocolate bars, book publishers, and Batman's arch enemy.

Why an ecosystem?

Digital Ecosystems are hard to understand. They stretch our mind's ability as they embody so many new concepts that we have no prior frame of reference for. We humans are used to being able to plan and control, which is no longer critical within the ecosystem logic. Just like the Internet itself, these ecosystems will be the sum of whatever its individual actors do. No one will ever know exactly how big they are or what is happening in them. Users become just a single actor in a bigger picture - like an ant in a colony. We will act as individuals but will also play our specialised role in a much bigger economic and social ecosystem. The importance of this is that within an ecosystem other factors start to work, such as social patterns and group behaviour, which can then influence, and be influenced by, the ecosystem. It is also hoped that real world natural phenomena from physics, biology and mathematics can be modelled as algorithms and embodied in the DBE to produce an ecosystem that self-adapts, self-organises, and self-evolves towards ever better business performance.

One small step?

To some extent, elements of these future systems exist already. As well as Napster and other peer-to-peer (P2P) applications, if we access our bank online then we are remotely operating our bank's computer and systems to perform transactions within it. Search engines are similarly doing work, finding us information from across the Internet, as instructed by us via our browser. In fact your Web browser may itself exhibit some crude properties of evolution. What you installed is very unlikely to be what you use today. It has probably been updated with later software versions, perhaps automatically on-line, without you even being aware of it. It may have received 'cookies' from the sites you visit, such as automated logons and information about what pages you have already seen, which then changes the pages you are offered. You may well have added plug-ins to enhance its functionality, such as viewing videos or PDF files. We are thus already in a world where our PC systems change themselves over time, so connecting this into an ecosystem is perhaps less of a giant leap than we imagine.

Further reading:

[links to introductory movies]

Project Fact File

The Digital Business Ecosystem (DBE) is being established by the DBE Project, an international Research and Technological Development project co-financed under the European Commission's 6th Framework Programme.

Project Title: Digital Business Ecosystem (DBE)

Public Web site: www.digital-ecosystem.org

Key contacts:

Subject	Contact	Email
Project Manager	Andrea Nicolai	a.nicolai@t-6.it
Research	Paolo Dini	P.Dini@lse.ac.uk
Computing	Miguel Vidal	miguel.vidal@sun.com
Business	Elmar Hussman	ehusmann@mac.com
Regional Catalysts	Javier Val	jval@ita.es
Media information	Neil Rathbone	neil.rathbone@daventryhouse.com

Funding:

Total funding, €14 million

European Union 6th Framework programme, Information Society Technologies (IST) thematic priority subvention, € 10.5 million

Partners:

[partner list from website (ideally with country and contacts etc.)]

Timing:

Start date: January 2004

End date: January 2007

Key dates: ????

Description:

The DBE Project is a 3-year international multi-disciplinary project to research, develop, and establish the Digital Business Ecosystem (DBE) - a revolutionary new Internet-based environment for business systems and processes - and in doing so to put Europe at the leading edge of the next generation of business software.

DBE Office

IBM Belgium

Woluwe Garden, Woluwedal 22

1932 St-Stevens-Woluwe, Belgium

Tel: +32 (0) 2 416 5912

Fax: +32 (0) 2 725 4117

Media resources

[DBE Logo]

[Partner logos]

[Pictures and biographies of key actors]

[Presentation slides]

Published Articles and Papers

Paper submission (HWU)

Three papers have been submitted to journals: IEEE Trans. on Evolutionary Computing (S5-S6), Computer Communications (S7-S8), and ACM Transactions on Agents and Autonomous Systems (S9-S10).

German Professional journal (FZI):

The FZI established contact to a German professional journal called "Digital Business Magazin" (www.digital-business-magazin.de) for dissemination purposes. The publishing house WIN-Verlag GmbH & Co.KG is interested in publishing articles about the business part of the DBE project in planned intervals. The target group of the journal are SMEs in Germany. Talks with the publisher about the publications and articles are still in progress.

Diploma Thesis (FZI):

Diploma Thesis regarding User Profiling Mechanisms will probably be supervised by the WP7 leader in 2006 to push the scientific aspect of "User Profiling Mechanisms within a P2P environment".

Paper in Evolutionary Computation Journal (HWU):

Mitavskiy, B. and Rowe, J.E. (To appear). An extension of Geiringer's Theorem for a wide class of evolutionary search algorithms. To appear in Evolutionary Computation.

Book chapters (UBHAM):

Rowe, J.E. (2005). Population dynamics of genetic algorithms. In Foundations of Learning Classifier Systems, Bull, L. and Kovacs, T. (eds). Springer.

Conference proceedings (UBHAM/HWU/STU):

- Mitavskiy, B. and Rowe, J.E. (2005). A schema-based version of Geiringer's Theorem for nonlinear Genetic Programming with homologous crossover. Foundations of Genetic Algorithms, Vol. 8. LNCS 3469. pages 156-175. Springer-Verlag.
- Chu, D. and Rowe, J.E. (submitted). Crossover operators for variable-length genetic algorithms. Submitted to Artificial Life conference.
- Briscoe, Heistracher, Kurz, Marcon, Masuch, Rowe, De Wilde and Woodward (submitted). Optimisation through a digital ecosystem. Under submission to EvoCOMNET.

Publication: A Network of SMEs for Competitive Services (STU)

(T. Kurz, G. Marcon, C. Masuch and T. Heistracher. A Network of SMEs for Competitive Services. Proc. Managing Global Trends and Challenges in a Turbulent Economy, MGTCTE'05, Angelis, V.A., Kyriakidou, O. (eds), October 13-15, Chios, GR: 001-007, 2005.);

Publication: Optimization through a Digital Ecosystem (STU)

A publication was submitted to EvoCOMNET conference and, if accepted, will be expanded to a full paper (G. Briscoe, Th. Heistracher, T. Kurz, G. Marcon, C. Masuch, J. Rowe, O. de Wilde and J. Woodward. Optimization through a Digital Ecosystem. Proc. 3rd European Workshop on Evolutionary Computation in Communication, Networks and Connected Systems, EvoCOMNET, April 10-12, Budapest, Hungary: 001- 012, 2006).

Paper on Artificial Life VOL II (UBHAM)

Rowe, J.E., Vose, M.D. and Wright, A.H. (2005). State aggregation and population dynamics in linear systems. Artificial Life, Vol 11, no. 4, pages 473-492.

Paper submitted to Physical Review E (UBHAM)

Rowe, J.E. and Mitavsky B.S. (submitted). Propagation time in stochastic communication networks. Submitted to Physical Review E.

Conference proceedings (UBHAM)

Rowe, J.E., Vose, M.D. and Wright, A.H. (2005). Coarse-graining selection and mutation. Foundations of Genetic Algorithms, Vol. 8. LNCS 3469. pages 176-191. Springer-Verlag.

Paper submitted (ICL and TUC)

A paper has been accepted for oral presentation at the 2nd International Conference on Computational Finance, with co-authors Maria Petrou, Konstantinos Giannoutakis and Surbhi Gautam. The title of the paper is "Study of the dynamics of a DBE".

Paper submission (ICL & TUC)

A paper is almost ready for submission in January 2006 to the journal Physica A, with co-authors Konstantinos Giannoutakis, Maria Petrou and Costas Palmer, and the title "Statistical models of a DBE".

2nd IST Workshop on Metadata Management in Grid and P2P Systems, Paper publications (TUC)

Paper title: "MOF-based Knowledge Management for a Digital Business Ecosystem".

Authors: Fotis G. Kazasis, Nektarios Gioldasis, Nikos Pappas, George Anestis, Stavros Christodoulakis

2nd IST Workshop on Metadata Management in Grid and P2P Systems (MMGPS): Models, Services and Architectures, December 17 2004, London, UK.

Papers submitted (TUC)

- Title: "SSLE: A Language and an Interactive Editor for the Semantic Description of Services in MOF Architectures".
Authors: Nektarios Gioldasis, Themistoklis Dakanalis, George Anestis, Nikos Pappas, Fotis G. Kazasis, Stavros Christodoulakis
CAiSE 2006, (submitted)
- Title: "The Design and Implementation of the Query Metamodel Language (QML)".
Authors: George Kotopoulos, Fotis G. Kazasis, Stavros Christodoulakis

CAiSE 2006, (submitted)

Paper presented at the ICSOC Workshop on Dynamic Web Processes (TCD)

Dominik Dahlem, David McKitterick, Lotte Nickel, Jim Dowling, and Bartosz Biskupski, "Binding- and Port-Agnostic Service Composition using a P2P SOA", ICSOC Workshop on Dynamic Web Processes (DWP), 2005.

Paper presented at the Workshop on Stochasticity in Distributed Systems (TCD)

Jim Dowling, Dominik Dahlem, and Jan Sacha, "Matching Distributed Systems to their Environment using Dissipative Structures", Workshop on Stochasticity in Distributed Systems (StoDiS), 2005.

Paper presented at the 3rd International Workshop on Databases, Information Systems and Peer-to-Peer Computing (TCD)

Jan Sacha and Jim Dowling, "A Self-Organising Topology for Master-Slave Replication in P2P Environments", To appear in Post-Proceedings of the 3rd International Workshop on Databases, Information Systems and Peer-to-Peer Computing (DBISP2P), 2005.

Paper presented at the SELF-STAR: Self-* Properties in Complex Information Systems, Hot Topics in Computer Science (TCD)

Jim Dowling, Raymond Cunningham, Anthony Harrington, Eoin Curran and Vinny Cahill, "Emergent Consensus in Decentralised Systems using Collaborative Reinforcement Learning", Post-Proceedings of the workshop SELF-STAR: Self-* Properties in Complex Information Systems, Hot Topics in Computer Science, LNCS 3460, 2005.

Paper included into the IEEE Transactions on Systems, Man and Cybernetics (TCD)

Jim Dowling, Eoin Curran, Raymond Cunningham and Vinny Cahill, "Using Feedback in Collaborative Reinforcement Learning to Adaptively Optimise MANET Routing", IEEE Transactions on Systems, Man and Cybernetics (Part A), Special Issue on Engineering Self-Organized Distributed Systems, vol. 35, no. 3, pages 360-372, May 2005.

Paper included into the ERCIM News No. 63 (TCD)

Jean-Marc Seigneur, "Decentralized Identity for the Digital Business Ecosystem", ERCIM News No. 63, Special: Security and Trust Management, October 2005.

Paper presented at IEEE/IFIP NOMS 2006 (WIT)

B. Jennings, P. Malone, "*Flexible Charging for Multi-provider Composed Services using a Federated, Two-phase Rating Process*", to appear in IEEE/IFIP NOMS 2006

Paper presented at HPOVU, Porto 2005 (WIT)

B. Jennings, P. Malone, S. van der Meer, "*A Two-Phase Rating Process for Dynamically Composed Services*", HPOVU, Porto 2005

Paper presented at eChallenges 2005, Ljubljana, Slovenia, 2005 (WIT)

B Jennings, P. Malone, G. Gaughan “*Charging for Dynamically Composed Services in the Digital Business Ecosystem*” eChallenges 2005, Ljubljana, Slovenia, 2005

Conference CAiSE 2006 Paper submitted (TUC):

Paper Title: “SSLE: A Language and an Interactive Editor for the Semantic Description of Services in MOF Architectures”.

Authors: Nektarios Gioldasis, Themistoklis Dakanalis, George Anestis, Nikos Pappas, Fotis G. Kazasis, Stavros Christodoulakis

XI International Conference on Industrial Engineering and Engineering Management IEEM, Paper submitted (ISUFI):

Paper Title: Emerging Technological Approach Supporting SME Transition Toward e-Business

Authors: A. Corallo, M. De Tommasi, G. Elia

Knowledge-Based Intelligent Information and Engineering Systems: 9th International Conference, Paper (ISUFI)

Paper Title: A Rule-Based and Computation-Independent Business Modelling Language for Digital Business Ecosystems.

Authors: M. De Tommasi, V. Cisternino, Corallo A.

Journal article submission - CACM special issue (LSE)

One article has been submitted by Mary Darking to the Communications of the ACM which is a journal that is widely read by academics and computing professionals.

Conference article submission - European Conference on Information Systems (LSE)

An article was submitted by Mary Darking to the European Conference on Information Systems which is an academic conference attended by around 2000 academic researchers.

Journal article submission - Journal of Information Technology (LSE)

An is being prepared by Mary Darking for the Journal of Information Systems which is an academic journal read by researchers from a range of social science and technology related fields.

Links

DBE in General:

<http://www.digital-ecosystems.org/>
http://www.nachira.net/de/refs/ref_era.html
<http://cordis.europa.eu.int/ist/ict-ent-net/index.html>
<http://fp6.cordis.lu/index.cfm?fuseaction=UserSite.FP6HomePage>
<http://www.cordis.lu/fp5/projects.htm>
http://www.europa.eu.int/information_society/topics/ebusiness/godigital/index_en.htm

Opensource

<http://www.opensource.org/>
<http://www.openmagazine.net/>
<http://www.fsfeurope.org/>
<http://europa.eu.int/idabc/en/chapter/452>
<http://www.coss.fi/en/contact/>
<http://europa.eu.int/idabc/en/document/2623>
<http://creativecommons.org/licenses/by-nc-sa/2.5/>

Computing websites

Live websites:

ExE (Swallow): <http://swallow.sourceforge.net/>
<http://sourceforge.net/projects/swallow>

SF (DBE Studio): <http://dbestudio.sourceforge.net/>
<http://sourceforge.net/projects/dbestudio>

Work in Progress websites – i.e. *not 'live' yet*:

EvE (EvENet): <http://evenet.sourceforge.net/>
<http://sourceforge.net/projects/evenet>

Accounting (Open Service Accounting): <http://openacc.sourceforge.net/>
<http://sourceforge.net/projects/openacc>

[SBVR tbd]

Latest regions in the DBE

http://www.digital-ecosystem.org/DBE_Main/new