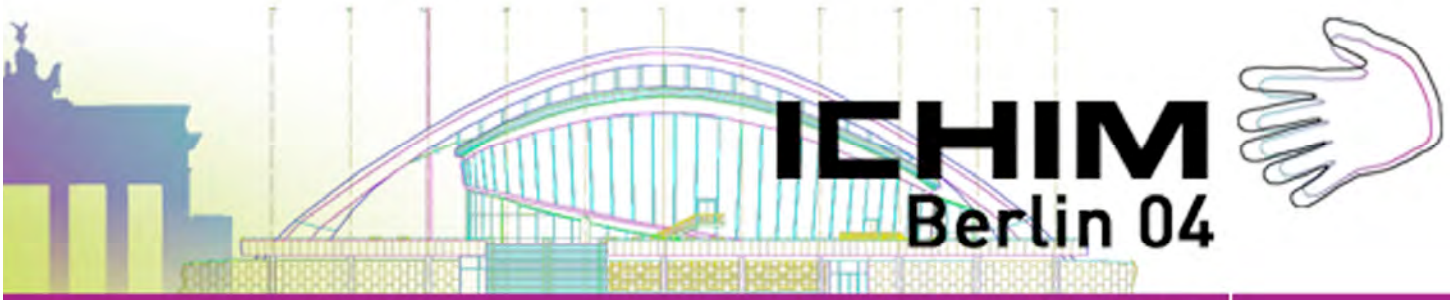

Digital Culture & Heritage
Patrimoine & Culture Numérique

Haus der Kulturen der Welt, BERLIN
Aug. 31st - Sept. 2nd, 2004
31 Août - 2 septembre 2004

THE ELEMENT PROJECT: OPTIMIZING THE PROCESS OF DISTRIBUTING DATA FROM THE CULTURAL HERITAGE SPHERE INTO THE PUBLIC DOMAIN VIA THE COOPERATIVE DEVELOPMENT OF A COMMON DATA INTERCHANGE NETWORK

Christopher Dalton, Matt Allbeury
Clinic New Media, Adelaide, Australia

http://www.clinicdesign.com.au

Published with the sponsorship of the French Ministry of Culture and Communication

Actes publiés avec le soutien de la Mission de la Recherche et de la Technologie du Ministère de la Culture et de la Communication, France

Interprétation simultanée du colloque et traduction des actes réalisées avec le soutien de l'Agence Intergouvernementale de la Francophonie

Abstract (EN)

The conference will expose the objectives of the project, an outline of the architectural configuration and the proposed relationship and cooperative development environment for a common data interchange network. ELEMENT (Electronic Linking of Education, Museums and Entertainment on North Terrace) is a project designed to link the cultural, education, science, technology and entertainment facilities within and adjacent to North Terrace in the city of Adelaide, South Australia.

The development of a common data interchange or portal will provide the necessary linkage to all member groups and to end-users and will allow for the distribution of related data to a host of disparate delivery devices.

The ELEMENT Project is essentially an architectural configuration that allows communication from a range of primary sources to end users via a multi-format data translation engine. The defining principle is that any selected data should be prepared once and served many times without resort to reconfiguration or technical intervention. Key data is also referenced with and available to be displayed alongside data derived from another source.

Keywords: Collaboration, Digital media, Technology, Interactive, Data management

Zusammenfassung (DE)

Der Vortrag wird die Ziele des Projekts, einen Grundriss der Architekturkonfiguration sowie die geplante Beziehung und das kollaborative Entwicklungsumfeld für ein Common Data Interchange Network beleuchten. Bei ELEMENT (Electronic Linking of Education, Museums and Entertainment on North Terrace) handelt es sich um ein Projekt, das zu dem Zweck entworfen wurde, die an und im Umkreis der North Terrace in der Innenstadt von Adelaide, Süd-Australien, liegenden Kultur-, Bildungs-, Wissenschafts-, Technologie- und Unterhaltungseinrichtungen miteinander zu verbinden.
Die Entwicklung eines Common Data Interchange Networks oder Portals wird die erforderlichen Verbindungen zu allen Mitgliedsgruppen sowie zu den Endnutzern bereitstellen und die Verteilung verwandter Daten an eine ganze Reihe disparater Delivery-Geräte ermöglichen.

Das ELEMENT-Projekt ist im Wesentlichen eine Architekturkonfiguration, die mittels einer Datenübersetzungsmaschine im Multiformat die Kommunikation von einer Anzahl von Primärquellen hin zu den Endnutzern ermöglicht. Das bestimmende Prinzip dabei ist, dass alle ausgewählten Daten nur einmal aufbereitet und dann viele Male ohne jede weitere Neukonfiguration oder technische Intervention zur Verfügung gestellt werden. Außerdem werden Schlüsseldaten zu den aus anderen Quellen herangezogenen Daten in Bezug gesetzt und können mit diesen gemeinsam angezeigt werden.

Schlüsselwörter: Kollaboration, digitale Medien, Technologie, interaktiv, Datenmanagement.

Résumé (FR)

Cette communication expose les objectifs du projet, les grandes lignes de son architecture et l'environnement de développement collaboratif d'un réseau commun d'échange de données. ELEMENT (Electronic Linking of Education, Museums and Entertainment on North Terrace) est un projet destiné à relier les équipements culturels, éducatifs, scientifiques, technologiques et de divertissement le long de North Terrace, le "boulevard culturel" de la ville d'Adelaïde, au sud de l'Australie.

Le projet ELEMENT est essentiellement une architecture qui permet la communication d'une grande variété de sources vers les utilisateurs, grâce à un moteur de transposition de formats de données qui autorise l'utilisation d'un éventail de terminaux incluant la téléphonie 3G, le web, les assistants numériques personnels, les SMS, etc. ainsi que toutes futures formes à venir de ces technologies.

Ce papier examine notamment comment le grand public et les universitaires utiliseront le réseau et les contenus qu'il rendra disponibles. Il décrit une méthode pour créer des ressources publiques en acquérant, standardisant, réorientant et optimisant des ressources numériques provenant d'environnements distribués.

Les musées de Science, les galeries d'art, les bibliothèques et les zoos ont su lever les contraintes traditionnelles et matérielles dans l'échange de ressources documentaires, et ont développé des initiatives de référencement collaboratif autour d'ELEMENT. De telles initiatives favorisent une

expérience plus interactive, immersive et participative du patrimoine culturel.

Mots-clés : Collaboration inter-institutionnelle, Nouveaux médias, Interactivité, Gestion de données distribuées

I. Introduction

Project Background

Adelaide, South Australia is a sophisticated, confident, cosmopolitan city of around 1.2 million people and is noted as the cultural capital of Australia. Settled in 1836, Adelaide has developed to encompass the vigour and excitement of a modern city, while retaining the charm and grace of the past.

Adelaide has emerged as a multi-dimensional, leading-edge technology and advanced manufacturing centre with a focus on the information technology, communications, medical, defence and automotive sectors.

By any international benchmark, it also has a high concentration of cultural attractions, a wealth of artworks; from the world's largest collection of aboriginal art and artifacts to contemporary works of every genre and a wide range of internationally acclaimed festivals.

The city centre is ringed with a broad belt of green parklands; the envy of most other cities in the world. Adelaide is a clean and well laid out city. It has a relaxed style and pace and in comparison to the rest of Australia, provides its residents and visitors with markedly more affordable and superior food, accommodation, travel and entertainment options.

It is also one of the world's finest 'education cities'. It has three internationally recognised universities, an extensive vocational training system, a wide range of specialised tertiary institutions and a highly regarded primary and secondary school sector. No other Australian city can offer an education system that is as well connected, focused and integrated.

Adelaide is noted as a tolerant city and is to a huge diversity of ethnic communities. As a city it can also lay claim to a number of innovations in business, education and establishing contemporary community standards.

In 1839 the Adelaide Chamber of Commerce was established, the first in Australasia and Die Deutsche Post fur Die Australischen Colonien, the first non-English language newspaper in Australia, was published in Adelaide.

In 1872 Adelaide was the first Australian capital city to be connected by telegraph with London and the first long-distance telephone call in Australia was made from Adelaide.

The University of Adelaide was the first in Australia to be able to admit women to degrees and in 1895 South Australia was the first Australian Colony to grant women the right to vote. South Australia was the first place in the world to allow women to stand for parliament.

The first public demonstration in Australia of wireless telegraphy was conducted by Professor William Henry Bragg at the University of Adelaide and in 1920 the Archives Department of the Public Library, Museum and the Art Gallery opened, the first public archives in Australia.

Photocopying using liquid developer was perfected by Messrs Ken Metcalf and Bob Wright of the Defence Standards Laboratory, Adelaide.

The city of Adelaide today is the home to major IT&T businesses, with significant investments made by Motorola, British Aerospace and EDS. Plus there are a growing number of IT pioneers, developers and integrators who have based their enterprises in Adelaide. South Australia as a whole has a rapidly expanding base of more than 700 IT companies, with 14 research centers of IT excellence.

These facts may to some seem irrelevant or insignificant, but as we progress you will note that they have a certain resonance when aligned with the process of distributing information from the cultural heritage sphere into the public domain and establishment of innovative means to achieve this.

The cultural and heritage sector in Adelaide is quite unique from a number of perspectives but for the purpose of this paper, we will look firstly from a geographic viewpoint. The city itself is one of the world's best laid out cities and was once described by New Yorker magazine once as "possibly the last well-planned and contented metropolis on earth." Adelaide must rank as one of the most civilized garden cities in the world, designed as it was by the far-sighted English surveyor Col William Light back in the 1830s. It combines the logic of the street grid system of Washington DC, the broad boulevards of Paris and the compactness of a Swiss market town.

The city centre, just one mile square, is deliberately bounded on all four sides by open parkland - just as the Colonel ordered. William Light was both meticulous is his planning as he was determined in his process. He even insisted that the city should not be contaminated by the 'social evils' of a seaport, making certain that the city be sited slightly inland. For ease of traffic he also commanded that city streets be wide enough to ensure that contemporary, bullock-hauled carts could do a U-turn without holding up traffic.

Adelaide is also the epicentre of Australia booming wine industry, which has been destined for a number of years to topple France as No.1 supplier to the UK market, a feat overturning a 1,000-year tradition. Locals argue long and hard whether wines from the nearby Barossa or Clare Valleys are superior.

The square mile city centre is bordered by North, South, East and West Terraces respectively. The North Terrace precinct was established by Colonel Light, as its cultural heart. From its north-eastern extremity and in walking distance from each other are located the Adelaide Zoo, the Royal Botanic Gardens, the National Wine Centre of Australia, the Royal Adelaide Hospital, the University of Adelaide, the Art Gallery of South Australia, the South Australian Museum, the State Library of South Australia, the Immigration Museum, the Adelaide Festival Centre, the Adelaide Convention Centre, the University of South Australia and the South Australian Tourism Commission.

To add another dimension to the focus of this paper, this cultural and geographic oddity that is North Terrace, Adelaide, South Australia, is further augmented by advances in new media technologies, innovation, an enviable ICT infrastructure and to some degree, chance.

The enviable ICT infrastructure resident in the North Terrace comes by way of Adelaide playing host to the World IT Congress in 2002. Global information technology services leader EDS ensured the World Congress on Information Technology 2002 lived up to its slogan 'Unleashing the Power'.

EDS delivered and managed the entire IT infrastructure for the 2002 Congress, integrating a complex communications network designed to impress the international audience. EDS worked closely with other Congress suppliers on a raft of IT initiatives. Including the hosting the

Congress website on its high performance web vault platform and handling systems integration for all supporting technology, including network-connected PC facilities, an email service and high-speed access to the Internet.

It was the task of EDS to impress the delegates by the scale, speed and complexity of the communications network that was put in place especially for the event. EDS also established a metropolitan area network for the event, and worked with Australian communications giant Telstra, on establishing a high-speed link capable of handling Internet connectivity of 10 megabits per second. EDS then integrated this with a wireless local area network (LAN) installed by the m.Net Corporation, which allowed delegates to access the Internet using wireless-enabled laptops and handheld computer devices. Delegates were also able to access a real-time messaging service using the network.

Once all the hoopla surrounding the event subsided, what was left was a world-class IT infrastructure lacking in only two things; content and users.

So what do you now have in the equation? You have a city with a multi-dimensional IT industry and a highly developed hard-wire and wireless infrastructure. North Terrace is home to a number of major cultural institutions, each sharing elements of common data with the other, but with no infrastructure in place to facilitate a seamless electronic exchange or threading of such assets. The IT infrastructure within almost every institution has been built up over time on a project by project basis, with little thought given (or budget available), to allow for any developments beyond the scope of each project.

The choice of deployment media used by any one institution or enterprise has also (almost without exception), been dictated by budget and lack of suitable alternatives, not by any particular preference by the end user.

Another factor to consider is the rising community expectation for better, faster and more efficient means to access various types and levels of information. This situation as evidenced around the globe, is far outstripping the ability for any one enterprise to deliver to meet this change.

There is also an ongoing requirement for all stakeholders to repackage, redesign and redeploy various resident content to suit a host of different audiences and media types when the same information already exists both within the enterprise, or within another enterprise operating in the case of Adelaide, within the same city precinct.

II. Project Overview

What has evolved from these points are the seeds of an idea encapsulated within the acronym, ELEMENT; the Electronic Linking of Education, Museums and Entertainment on North Terrace. The ELEMENT Project in its crudest form, is an initiative designed to provide better access to more information relative to or emanating from, North Terrace, quickly and efficiently. It is all about providing ready access to current, complete, accurate and linked data within an integrated and transparent framework.

As an example of a functional model an example in principle can be found within the South Australian Museum. The principle behind the technology architecture inherent to The ELEMENT Project can be found in the content procurement, referencing and deployment strategies being adopted therein.

Basically, new data is entered once into a content management system; in this case, Knowledge Engineering's collection management system, KEeMU. KE Software was established in 1984 to market Titan, a post-relational information management system utilizing a unique indexing algorithm developed by researchers from the University of Melbourne and the Royal Melbourne Institute of Technology.

International clients include the National Natural History Museum (Smithsonian), London Science Museum, Canadian War Museum, House of Commons Canada, Museum of Science and Industry USA and the New York Botanical Garden.

Australian clients include Art Gallery of South Australia, Australian Museum, Australian National Herbarium, Australian Stock Exchange, Botanic Gardens of Adelaide, Melbourne Zoological Gardens, Museum Victoria, Immigration Museum, National Gallery of Australia, National Herbarium and the Powerhouse Museum.

The strategy employed within the South Australian Museum equips them with the means to simplify the management of all types of data and enables the enforcement of ratified design standards and content development practices across the breadth of the organisation. The hardware and software solutions developed to achieve this have been branded as ICE and FIRE respectively. ICE is a Content Management System and FIRE is a multi-purpose, re-deployable multimedia output driver. In the South Australian Museum environment ICE and FIRE are connected together by the Local Area Network (LAN). This connectivity is based around wireless network technology and hardwire networks which has allows delivery and remote editing capabilities and serves to overcome problems caused by most typical infrastructure limitations.

Developed in Australia ICE and FIRE have been designed specifically to meet specific and rigorous demands inherent within the museum, gallery and interpretative centre environments. Traditionally, delivery of multimedia in institutions has employed numerous ad hoc systems - with many different and specific proprietary hardware devices and software environments required in order to make even the most modest interpretive vision a reality.

The 'back of house' ICE Content Management System allows for individual stakeholders to update, manage and display relevant information in a single action prior to the deployment and instant publication to any devices connected to the system network. Via the accelerated hardware delivery engine FIRE, the end point delivery devices include interactive touch screens, websites, PDA's, plasma screens, SMS and future manifestations of such technologies.

In any viable content delivery system, the actual content delivered is invariably the most expensive element to produce. The ability of ICE and FIRE to leverage existing content assets into new projects therefore, is an essential key to ensuring the cost effectiveness of this particular delivery solution. To this end, the introduction of ICE and FIRE into an institution introduces the concept of asset or source material reuse, quite naturally. Consequently, one of the single most important aspects of any comparable delivery system is how readily it can access and manage assets from a content management system and reconfigure and optimize these assets into a deployed presentation. ICE and FIRE in this respect, has few peers.

With ICE and FIRE, staff at every level gain full control of their content area through a remarkably easy to use web interface. When any information is changed at any single, controlled entry point it is also changed across the full spectrum of the network without any technological intervention whatsoever. The delivery devices can be linked wirelessly to a main administration area so as they can also be relocated or repurposed for special events or exhibitions.

The ELEMENT Project is essentially an extension of the FIRE and ICE architectural configuration and data management philosophy. In much the same way, The ELEMENT Project would serve to link common references and data types with other institutions so as end users could gain a much richer and broader understanding of their subject matter.

ELEMENT will allow for communication between a range of primary sources (ie. Art Gallery of South Australia, South Australian Museum, State Library of South Australia, University of South Australia, Adelaide University, South Australian Tourism Commission, Adelaide Zoo, Adelaide Botanic Gardens et al), and provides for the distribution of related data to end users, again via a host of different media delivery mechanisms.

The ELEMENT Project vision is that local, national and international visitors to the network will be able to access referenced data and information, products and services currently housed within a myriad of organizations and data warehouses. This information will be available through a single and transparent source and will allow the user of the system to dictate their preferred method of delivery.

Access to this network will be by way of any currently available delivery device, with provision built in to accommodate future information collection and deployment solutions.

The following are some of the main drivers behind the implementation of such an infrastructure:

- Maximizing the economic and social benefits from investment already made in a unique ‘wired’ city precinct.

- Providing a contemporary gateway to assets of great cultural significance.

- Facilitating industry development across all sectors, with an emphasis on providing benefit directly to 'enabling' industries such as ICT, tourism (including niche tourism sectors such as wine tourism, fossil tourism and cultural tourism), wine and bio-Innovation.

- Creating a greater mass through which opportunities for larger and more gratifying funding initiatives for resident cultural institutions will exist.

- An emerging world market focus on the areas of smart phones, digital television, web services and wireless networks.

- The current inability to provide rural and remote communities with sustainable educational, cultural and entertainment content mechanisms with a sufficient depth and breadth as to be comparable with (and as inclusive), as the options available to the community in a metropolitan environment.

- Advances in interoperable and integrated technologies

- Changing social priorities, expectations and attitudes

In the course of developing the ELEMENT concept a number of priority actions for development were identified. These included:

- The briefing all prospective stakeholders on the benefits of such an infrastructure.

- The addressing of institutional arrangements and establishment of the roles and levels of engagement for all parties.

- The development of a full project scope so as to outline the staged development of the project up to launch phase.

- The establishment and refinement of the inherent principles of custodianship of the system.

- The development of copyrighting and data access policies and guidelines
- The formulation of agreements for access and management of date between private and public bodies across the breadth of the stakeholder cluster
- The design and implementation of an extensible enterprise-wide data directory
- The engagement of stakeholders in the remote and isolated communities so as their needs are addressed in the selection and deployment of content.
- The development of flexible and non-biased standards of operation
- The initiation of negotiations related to the establishment of cost-effective data transfer charges for all stakeholders and users of the system
- The development of partnerships so as to continually integrate new technological advancements into the evolving framework
- The elicitation of widespread community, corporate and government support for the project and its inherent benefits and maintain that support at all stages of development

In terms of its architecture, The ELEMENT Project consists of a network of distribution services, service providers and data storage facilities currently maintained by government agencies, private sector companies, academia, cultural institutions, community organisations and various sectors of the IT industry. The basic premise of ELEMENT is in the interoperability of search and access mechanisms across these multiple data aggregation and distribution points. Data and service providers will have the flexibility to support one or many views to their data, while controlling access to their data holdings in accordance with accepted intellectual property, access policies and license arrangements.

In a singular environment such as the South Australian Museum, a system such as ICE interrogates in-house data repositories and searches for records, translates and optimizes this data for display in a host of different delivery mechanisms. ELEMENT is an extension of this same

philosophy. The ELEMENT Project is essentially an architectural configuration that allows communication from a range of primary sources to end users via a multi-format data translation engine. The defining principle is that any selected data should be prepared once and served many times without resort to reconfiguration or technical intervention. Key data is also referenced with and available to be displayed alongside data derived from another source.

Ordinary visitors and academia will use the network and the material it makes available to examine objects and other interpretative resources, both in isolation and with information intrinsically linked and organized within the system. Museums are both non-competitive and non-evaluative environments where a visitor is free to wander without hindrance and learn and draw their own conclusions from concepts pertaining to the objects displays. The development of engaging (yet still manageable and affordable for the particular institution) rich media presentations has always been a focus in the development path leading to FIRE and ICE technologies. However, it is in the instance where further background material may be required by the visitor and where the visitor cannot physically visit the institution(s) that a concept such as ELEMENT has real resonance. The belief is always that real objects carry the most weight in the interpretative process and should have priority but it is in the referencing of what is learned by way of this physical experience, with information drawn from other learning repositories in real time via the visitors own personal delivery mechanism i.e. laptop, PDA or future manifestations of such devices, where advancements can be made. The scope of the ELEMENT Project is to increase markedly the quality of cultural appreciation and at the same time, provide many more opportunities for learning and engagement through a collaborative approach to information management and dissemination.

Even without the initiation of the ELEMENT Project, museums, galleries, libraries and zoological institutions have already responded to the release of physical and traditional constraints placed on assets interchange and collaborative referencing with new initiatives developed around ELEMENT. Such initiatives serve to promote more interactive, immersive and participatory experiences and provide argument of what this collaborative approach to data exchange can offer.

The ELEMENT is an ambitious concept. It is designed to link the cultural, education, science, technology and entertainment facilities within, adjacent to, or intrinsically related to North Terrace, Adelaide, South Australia.

When you think about it, any one aspect of The ELEMENT Project should be deemed ambitious. To develop an easy to use, elegant data exchange so as to seamlessly transcend any one particular organisation's boundaries in a search for related information is a difficult task. The ultimate aim is to build a communications conduit between singular information repositories so as to satisfy multiple levels of end-users amongst the wider community.

When the same system allows for the distribution of common or related data to a host of disparate delivery devices; including G3 mobiles, websites, PDAs, interactive touch screens, plasma and LCD screens, printed documents, SMS, facsimiles and any future manifestations of such mechanisms, we are talking about a communications strategy of note.

Whilst the underlying technologies are complex, The ELEMENT Project strategy in essence, is quite simple. The focus is to augment and maximize an existing ICT framework so as to provide a two-way communications platform for Adelaide-based cultural entities and industry to expand their influence and markets for the world to tap into. It would provide a front door across numerous platforms to vast resident repositories of knowledge and expertise. At the same time it would provide an information resource for the people of Adelaide with a breadth, scope and dynamism unparalleled anywhere in the world.

In Adelaide we are very fortunate. We have the technology and the capabilities to make The ELEMENT Project a reality. We have world-class education, science, technology and entertainment facilities all contained within a pre-existing precinct wide infrastructure.

The ELEMENT Project does however, still pose the question. If we have what it takes to achieve an outcome in theory, what is it going to take to make it happen?

To date, the process is still progressing and I would hope to report in the very near future that ELEMENT project, the process of distributing data from the cultural heritage sphere into the

public domain via the cooperative development of a common data interchange network is at last a reality.

References:

H. G. Viney (1936) A Century of Commerce in South Australia 1836-1936

W. G. K. Duncan & R. A. Leonard, 1973 The University of Adelaide 1874-1974

A.C. Castles & M.C. Harris (1987) Lawmakers and Wayward Whigs

J. F. Ross (1978) A History of Radio in South Australia 1897-1977 1978