

Building and sustaining national ICT/education agencies:

Lessons from Australia (EdNA)

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Executive summary

Education Network Australia (EdNA) operated for fifteen years (1995-2010), providing a national education and training portal for quality resources, technology standards and educational community spaces. It was initiated in 1995, at a time when the World Wide Web was new and a number of significant international and national reports had been written about harnessing the benefits of digital technologies for education and training.

This paper examines the origins and development of EdNA as a national collaboration of education authorities and as an online portal. It begins with an overview of the Australian context. It then goes on to outline the Australian context within which EdNA grew, the processes put in place to achieve its goals and the progress of EdNA as an ICT education initiative. A brief analysis of key internal and external factors and of policy outcomes then follows, before some concluding comments that highlight the dynamic nature and complexity of integrating ICT in education at a system-wide level.





1. The Australian context & origins of EdNA

Education and training in Australia is organised as a federated model, with the national Commonwealth government and individual governments in each of six States and two Territories. Each of the latter eight jurisdictions (which will be referred to as States in this paper), has a mandate for education and training and receives funding from the Commonwealth Government to achieve this mandate. State education in schools caters for approximately 66% of all school students (Australian Government, 2011, p. 4). In addition to state managed schools, the Commonwealth government directly funds non-government schools that are organised as Catholic (20%) and Independent schools (14%). Independent schools commonly have religious affiliations although a number of non-denominational and secular schools are included. Overall, Australia has 3.5 million school students.

Training in Australia occurs in the senior secondary school years or in a post-school training college. Each State manages Technical and Further Education (TAFE) training colleges and oversees a number of private training colleges. In addition, Australia has 38 universities and a range of institutions that conduct accredited university courses.

EdNA (Education Network Australia) was a collaboration of all of Australia's education and training sectors, operating under a joint Commonwealth/State funding agreement and including participation from the States, the Commonwealth and universities. Representatives from all of these jurisdiction formed the EdNA Reference Committee (ERC) [later called the Australian ICT Education Committee (AICTEC) (<http://www.acitec.edu.au>)], which reported to the annual meeting of all Australian education and training government ministers, providing advice on major policy issues associated with the use of computer networks in the delivery of education. In addition, a national education and a training technology agency (Education.au limited) provided the governance and operational management for the EdNA collaboration and the development of the EdNA online education portal.

Origins of EdNA

There were numerous technology reports sponsored or undertaken by the Commonwealth Government in the early 1990s. These reports focused on higher education, the types of technologies being used and their applications in education, the convergence of technologies. These national reports recommended directions for change in education and training, and gave impetus to the need for strong education participation in in the development of sophisticated education network services.

In 1993, the Australian council of education and training Ministers (MCEETYA) established the Open Learning Technology Corporation (OLTC) as a company owned by the Australian Ministers of education and training. OLTC's role was to encourage and support high quality, cost effective open learning on a national basis, providing a focal point for collaborative activities and general promotion. By 1995, the Ministers had agreed to establish an Australian education network (to be called Education Network Australia or EdNA) and processes to determine the content needs, the network services and the reception infrastructure were initiated.

It was anticipated that EdNA would benefit Australian education and training in a number of ways. These included affordable tariffs for network users, a publishing platform for Australian education, software development and distance and open learning techniques, national collaboration on curriculum frameworks and a culture of innovation in the production and distribution of educational material mainly for domestic use with spin-offs for export markets. Also attractive was the combined purchasing power of a national organisation to provide computers in order to access the network.

EdNA also enabled state education authorities, together with the Commonwealth government, to cooperate in a number of ways, such as thinking through, collectively, new education policy issues arising from the emerging digital technologies, utilising common resources and ideas, and learning from one another in the new environment created by the World Wide Web. Further, they could address concerns regarding the protection of young people from undesirable content and persons using the internet while at the same time encouraging the development and use of responsible, effective, high quality educational resources.

EdNA was to become a cross sectoral online service for use in school education, training and university education. It was designed as a collaborative national effort, in the hope that the participating stakeholders, as a collective, would avoid duplication of effort and gain more than if they operated separately. The idea of adding value to online educational resources through accessing, sharing and developing further networked linkages was uppermost in the minds of the stakeholders. However, there also remained a strong fear that sectors of education which were already making use of computers in education had the potential to form islands of non-connectivity and duplication. In practice, an operational framework for the leadership and management of EdNA was designed to avoid this outcome.

Processes

By the end of 1995, the task of putting in place some of the building blocks to establish the information service was underway. National consultations for EdNA were undertaken by a small expert working group whose task was to consider participation in the network and the issues that would need to be addressed. In addition, the full definition of the business requirements for a national education network were the focus of the ERC, which, as an inclusive stakeholder reference group, was intended to ensure that the description of the network business requirements developed by the Commonwealth properly reflected education systems' needs.

In mid-1996, the OLTC was restructured to focus solely on the governance, strategic directions and management of EdNA and the ERC was established to provide advice to Ministers on major policy issues associated with the use of the computer networks in the delivery of education. Agreement was reached on a joint Commonwealth/State cash flow required for establishment costs of EdNA in its first three years of operation. Specifically, a sum of over \$635,000 was allocated by the Commonwealth to the ongoing maintenance and upgrading of EdNA and the States also agreed to collectively contribute the same amount annually on a pro-rata population basis. In 1998, the funding for the governance and management of EdNA was increased from the original \$1.27m to \$1.58m and the management of EdNA was moved from the Commonwealth to a new national agency which was named *Education.au Limited*. The collaborative funding by the national and State Governments continued until EdNA's demise in 2010.

The EdNA Reference Committee (ERC) remained fundamental to the effective leadership and management of EdNA. It continued to be led by the Commonwealth and it continued to guide the overarching development of EdNA's development. Consistent with a collaborative model of operations, ERC was supported by three national advisory bodies: one each from schools, training and higher education. Each provided a grounding influence on the development of EdNA through their direct consultations with their respective sector.

One of the major and lasting efforts of the ERC that guided the development of the collaborative EdNA was the set of principles for inclusion of content on the online service. These principles, known as content standards, agreed in 1997, were a major element in laying the foundation for the nationally agreed understanding of collaboration between national and State governments

and the education sectors even though they were conceived to guide content inclusion. There were twelve principles which included the following key selection:

- *Australian perspective:* EdNA serves Australian education. Its organisation, services and standards will reflect this Australian perspective. EdNA will actively seek and promote Australian content that meets the standards.
- *Collaboration:* The principle of collaboration was determined by MCEETYA in 1996 and constitutes a formal policy for EdNA. Collaboration occurs in a range of specific forums as well as through broader consultation.
- *Comprehensiveness:* The services and links on EdNA aim to be sufficiently comprehensive to cater for the full range of Australian education and training.
- *Networking:* EdNA is a social networked service and it therefore develops and uses tools and administrative processes that support networking. This requires distributed or decentralised processes within a documented framework.
- *National benefit:* EdNA is a national network of the education community in Australia and is resourced and supported by all Australian governments. EdNA therefore provides a publicity channel for educational material of national significance. It will be more than the sum of its parts as it seeks to leverage products and services for national benefit.
- *Public domain:* EdNA is publicly funded and will operate in the public domain.

These principles were also fundamental to the operations of Education.au Limited as the national agency managing EdNA. In framing a constitution for Education.au Limited, the education stakeholders emphasised the importance of collaboration as the purpose of the agency and its required method of operating. The Board of Education.au Limited consisted of sector-nominated members together with a Commonwealth Government nominee, a number of experts in finance, business and legal affairs, and a chair appointed by the Commonwealth. The operations of Education.au Limited and the implementation of EdNA were led by a Chief Executive Officer with the advice from an expert leadership team.

2. Development and implementation of EdNA as an ICT in education initiative

The launch of EdNA in November, 1997 was followed by a frenetic period in which online communities proliferated and were encouraged by Education.au Limited. The following account traces the progress of EdNA under six headings: initiation; collaboration; EdNA growth; establishing online communities; interactive collaboration; and personalisation.

Initiation

EdNA was the first database-driven educational website in Australia, built around the concept of a browsable and searchable directory of online resources. One of the first collaborative tasks of the ERC and its advisory groups was to nationally agree on the directory of information categories for each of the three education sectors, so that an online directory service could be built.

The ongoing work to agree the education information categories came from a view that access to the stored information would be by browsing the hierarchical categories of information in the relevant (schools, training, university) education sector. Within a year, browsing appeared to be insufficient and a search function was developed for the EdNA Directory Service. The development of search functions, such as a 'simple' search and an 'advanced' search, led to the realisation that metadata, that is, standardised keywords in a purposeful structure, would be needed to retrieve digital resources easily. The schools group developed guidelines for EdNA about content standards for schools, gathering and managing content, publishing standards, directory services and quality assurance. During this initial development period of EdNA, the importance of ensuring the interoperability of the EdNA services with those online services being developed by the States cannot be underestimated. In time, this work was expanded to include the requirements of the training and higher education sectors resulting in the EdNA Metadata Standard based on the internationally accepted Dublin Core Metadata initiative. The draft version 0.3 EdNA Metadata Standard was adopted by the Commonwealth Government in 1997 and the version 1.0 approved by the stakeholders in 1998. The EdNA Metadata Standard had been developed as a minimalist set of elements to ensure interoperability with other networked systems

Metadata became an essential tool for efficiently finding online resources using search functions. As intended, it also enabled the EdNA service to become interoperable with State online services. In 1997, the Commonwealth department of education became a member of the IMS Project, a global body developing online standards, including metadata, for educational internet services. The Australian metadata and technical efforts were maintained and strengthened through engagement in the global IMS forum, which led to alliances with other standards bodies such as SCORM, SAKAI and SIF. The engagement with the IMS Project helped to keep EdNA services technically up to date as well as to provide technical interoperability protocols for national and State online services.

The experience of developing an Australian metadata set, such as the EdNA Metadata, from the ground up was a complex task and proved to be time consuming, starting in 1995 and finally being approved by the ERC in 2000. However, the pursuit of globally accepted technical standards and their adaptation to the local context, and adoption in Australian education and training enabled efficient linking and sharing of resources, as well as development of wide ranging services for online professional education communities.

Collaboration

As indicated earlier, collaboration and cooperation were embedded in the constitution of Education.au Limited and in the key principles developed for the operation of EdNA. Specifically, Education.au Limited was required to foster and facilitate cooperation and collaboration with Education Bodies in the use of education communications and the internet. In addition, the Constitution mandated that Education.au Limited initiate collaborative activities in maintaining its relationships with education departments throughout Australia. While stakeholder representation on the Board and its various committees did not necessarily carry with it, all documentation included concepts such as networking, coordination, cooperation and collaboration. Over time, one question that arose, and which is explored later in this paper, concerned the distinction between these ways of operating.

The national stakeholder group ERC played a central role in the development of EdNA. Each step in developing the EdNA service was summarised and considered by the schools sub-group, and the training sub-group. The national stakeholder group included members of both the schools and training sub-groups plus other national officials, a number of nominees from higher education and a member from Education.au Limited.

In addition, a full-time project officers for schools and one for training met regularly with Education.au Limited and a dedicated EdNA staff team from the Commonwealth education department for the first two years to ensure cross sectoral communication between the schools and training sectors, and Education.au Limited. The sectoral project officers met frequently in a number of modes including face to face as well as meetings using group and individual emails, telephone, especially teleconferencing, and occasionally using commercial videoconferencing services. The use of diverse communication e.g. telephone, conferencing, and online services for collaborative planning and operational aspects of implementing EdNA became commonplace. In fact, one of the earliest efforts using online collaboration was in 1998 when a web-based conferencing system was introduced to manage consultation about the progress EdNA projects. The use of this system was mainly for information and services projects whereas overarching projects continued to use face to face meetings, teleconferences and email.

The need to communicate frequently on a national basis also led to the frequent use of email group distribution services as part of the EdNA Directory Service. Email distribution groups were used prolifically to advance ideas, canvass opinions and notify decisions about developing and implementing EdNA. However, email services, although useful for distributing information were not seen to be ideal for decision making because of their asynchronous nature and inconsistent response periods. Emails also arrived out of order which caused some consternation, at times, for the sectoral project officers. However, the email distribution groups were the first of the interactive services widely available from the EdNA information directory service and were used prolifically. The email distribution groups were the beginnings of the online collaboration among EdNA participants.

EdNA growth

When Education.au Limited took responsibility for EdNA in early 1998, it introduced a national education and training news service for each of the education sectors plus a noticeboard of national education events and celebrations. In this period of development, 1997 to 1998, collaboration of State and Commonwealth government education and training officials with the agency about content and harvesting links was frequent and frenetic. Project officers for the Advisory Committees met physically and communicated regularly online with officers from the Commonwealth and Education.au Limited to plan and advise on EdNA projects. Decisions arising from collaborative efforts were confirmed at meetings of the relevant schools and training sub-groups who reported to the ERC which determined the annual directions for EdNA. Agreement by the ERC was a condition of funding from the Commonwealth to secure the annual

funding for EdNA and the projects that were agreed to be implemented by the national agency in the coming year.

By 2002, EdNA had become a 'meta-network' of Australian educational practitioners having access to thousands of online resources. Additionally, through its discussions, noticeboards and forums, it consciously fostered a range of online education professional communities.

Establishing online communities

The use of the group distribution of email led to the emergence of a number of online professional education communities outside of the operational and decision making groups responsible for the developmental plans for EdNA. For example, school librarians, mathematics teachers, language teachers, trainers and many more began to manage their professional association's business and communication online. By 2008, the school sector had the largest number of email distribution lists.

However, also by 2008, many distribution lists had moved to other and newer interactive community services available on EdNA, such as forums and groups (although news syndication services continued to grow). For example, between 2004 and 2008 the number of EdNA Groups grew by 972% and the number of participants in Groups grew by 492% although not all educational communities encouraged by the EdNA project used the EdNA online services.

The access to EdNA increased steadily in the early years of the new century: the number of visits to EdNA between November, 2000, and February, 2003, rose from 75,000 visits to 200,000 visits and the number of page views increased from about 600,000 in November, 2000, to 1.6 million page views in February, 2003. Further, during the same period, the number of EdNA projects also increased as the States developed their own local services using EdNA applications.

Then in 2003, after a lengthy two-year national consultation period with States, EdNA was redesigned and launched as a global aggregator of quality educational resources with an integrated suite of collaborative web services. One of the main new features of the new EdNA suite of services was the innovative distributed search architecture which enabled EdNA to search multiple databases in real time. This meant that EdNA was able to search digital library collections, websites and repositories where reciprocal agreements for access to information and common metadata standards had been established. The effect of this was that EdNA users could search large databases of information through one EdNA entry point.

This new feature further increased usage of EdNA due to the wider access to quality educational resources from global databases. In addition, as the capacity for States to download and embed shared EdNA applications and services increased, so did EdNA's usage increase. Shared EdNA applications embedded by the States in their own web based services included search and browse, forums, chat services, noticeboards and news feeds or content syndication. These shared information services were partly responsible for a rapid take up of the EdNA services between 2003 and 2004. This was an indication that collaboration was beneficial to EdNA's development through collaborative advisory groups and also in the formation of online education communities.

Interactive collaboration

In time, the sector Advisory Groups and AICTEC (formerly ERC) developed briefs wider than EdNA Online, although EdNA remained an important part of their regular agendas. AICTEC, for example, engaged with national ICT in education and training policy issues across the three education sectors: schools, training and universities. Issues such as broadband, technical standards, copyright and infrastructure gained considerable national focus and attention to EdNA became a monitoring role. The training sector and schools sector renamed their

committees in 2001 and removed EdNA from the names of their committees. The intention of both was to focus more on ICT policies nationally and as act forums for new sectoral and common initiatives.

This series of changes had a two-fold effect. The first was the widening of interest in ICT issues in education and training, and the second a changed focus from singly focused meetings and detailed accountability for the development of EdNA to a monitoring role by the sectors through the newly restructured national AICTEC. As a consequence, Education.au Limited, in 2001, established its own EdNA Online Advisory Committee (EORC). The purpose of EORC was to ensure ongoing consultation about the direction and development of EdNA with the sectors and the States. The change from having three major committees involved in the development of EdNA to a single and EdNA focused body reduced the amount of time for the managers of EdNA to consult about the directions and management of the service. Consultations became more streamlined enabling speedier decisions about the future development plans for EdNA. In this new governance environment, there emerged EdNA's first significant online web based collaborative service called EdNA Groups which was trialed in late 2004 and made publicly available in early 2005.

EdNA Groups was the beginning of a suite of collaborative web based online services enabling education participants to share and interact using text, audio, graphics, photographs, movies, links, and more recently online real-time discussions including online conferencing, that is, web 2.0 applications. By December 2007, there were over 1300 groups with nearly 17,000 members who were logged as 117,568 unique visitors making 308,792 visits and viewing 7,529,886 pages. The use of the interactive EdNA Groups service by education sectors was interesting because the training sector operated 420 groups whereas the schooling sector operated 351 groups, which was the opposite of the use of email distribution lists where schools dominated. The take-up of interactive EdNA Groups can be seen to be quite rapid signaling that such a service was seen as useful and valued by educators and trainers.

Personalisation

The collaborative professional community in which educators were engaging can be more starkly demonstrated by viewing the steady take up of the personalised services. These services, although they were first piloted in 2006, were launched in February 2008. They enabled sharing of personal profiles and social networking. In 2006, EdNA released a host of Web 2.0 interactive communication functions including blogs, audio feeds, wikis and personalised services such as personal searches, together with a rich base of easily accessible information resources. A new service, called MyEdna, enabled users to personalise their use of EdNA and to construct and save their own education profiles. Then in January 2008, personalisation was taken a step further with the launch of 'me.edu.au' personalised services for professional networking and sharing common online interests through the use of online personal profiles.

The national education and training online web service of EdNA had moved from being a single source comprehensive global resource based and collaboration online web service for education and training professionals, in the first instance, to become a personalised web service enabling the formation of communities of professionals with access to high quality educational resources and services. The rapid growth of education communities with the EdNA Groups services and then the growth of the 'me.edu.au' personalisation services was an indication that teachers and education professionals valued collaborative and personalised services.

Consultation occurred through national ideas workshops, State consultations, online engagement and discussion with users, trialing of new services by users and some consultation with AICTEC. What was noticeable throughout this period was the high level of engagement of EdNA users in online collaboration and online testing of new EdNA services. Collaboration

among the stakeholders, on the other hand, would appear to have moved its focus from EdNA towards the development more broadly of national policies and procedures.

The evidence suggested that Education.au Limited had become a trusted and innovative body supported in governance by a strong Board. It had also developed a very high level of education online business strategies and technical skills that could be harnessed by the States as they built their own online services. This period became the most innovative for new EdNA services, the most streamlined for national consultations and also enabled faster development and delivery of EdNA online services.



3. Analysis

Internal factors

Education.au Limited expended considerable effort maintaining regular high level contact with Ministers, senior education officials and the Commonwealth government through visitations, meetings, and the provision of news and information services. International alliances for the purpose of sharing information and disseminating new online innovations were formed with a number of national ICT agencies in other countries. In fact, senior education officials from the UK visited Australia to understand the EdNA collaboration and used that model to inform the development of the UK national ICT agency which was based on a number of aspects of the Australian model e.g. portal services and governance structures.

Internally within Education.au Limited a range of specialists were employed to develop the EdNA services. They included expert librarians, education and training experts, strategy planners, technical experts and online web developers. The relationship between the education people who understood education and training culture and the technical experts who understood online development was robust and vigorous. Many of the new ideas were implemented through intermediaries such as business analysts and strategic planners.

One area of considerable difficulty was in the funding area. Approval of the plans for the development of EdNA for the coming year based on the extensive national consultations was needed for approval from the national government for operational and business funding. Funding was often delayed by the national government because of their internal changes which raised the level of risk for the development and implementation of EdNA. This situation was not understood by the education and training stakeholders and delays became a cause of some friction with stakeholders from time to time. The internal cohesion, goodwill and collegial support among staff of the national agency diminished the risk to some degree. However, for such circumstances the agency did have to develop some financial reserves which reduced the overall pool of funds for the development of EdNA.

External factors

The professional communities that collaborated for the benefit of EdNA have occurred in both physical and virtual spaces. The characteristics of collaboration (shared leadership, goals, processes, decision making, change, intelligence, flexibility, communication and diversity in thinking and an appropriate level of technical competence) were clearly evident during the initiation phase of EdNA. Commonwealth leadership brought the States and education sectors together for a common purpose to share resources using EdNA and to develop policies for the implementation of EdNA. Consultations about the vision for EdNA occurred with the States, plans were developed and adjusted through feedback from education system stakeholders and decision making was collective.

The development of the directory service of resources, and search and browse functions continued the collaboration to develop EdNA that had been established by the Commonwealth. At this time the Advisory Groups for each sector became active and made significant contributions to the overall development and management of EdNA, although, contributions were stronger from the school sector than the training or higher education sectors. However, as the development of EdNA became more routine and as Education.au Limited took on greater responsibility for consulting with the States about the future development of EdNA and as the States looked to a wider national agenda for ICT, then collaboration about EdNA moved to become cooperation (exchanging information, altering activities and sharing resources) and finally, coordination (exchanging information, altering activities).

Over time, the coordination mode of operation led by Education.au Limited became the norm for the development of EdNA. Education.au Limited used national think tanks, consultations with the States, feedback on plans for the development of EdNA and an internal Education.au Limited committee to make recommendations to the Board for passage to the Commonwealth for the approval of funding. This complex process of coordination continued throughout the development of the new shared information services in 2004, EdNA groups in 2005 and me.edu.au in 2008. However, with the advent of EdNA Groups, online collaboration for the further development and refinement of EdNA initiatives emerged as an important factor because it engaged such a wide audience of users. During the development of me.edu.au over 4,000 EdNA users made contributions or were engaged in providing feedback for further developing the service. The online collaborators operated within a clear framework to harness the collective intelligence of a range of diverse ideas through flexible and open communication.

Collaboration with stakeholders decreased as the processes moved towards coordination from 2001, whereas collaboration with users increased through the use of the Web 2.0 type EdNA Groups facilities in 2005. What is noticeable is the degree of innovation that occurred throughout the coordination period. By way of contrast, collaboration occurred among stakeholders when the issues were new, interesting, and posed common education challenges and collaboration occurred online among users when they were able to contribute to the trialing and development of the EdNA service. In fact, when the level of influence occurred at the national and Ministerial level then collaboration among stakeholders was strong. However, when the level of influence moved to the level of Education.au Limited, then the processes for involvement in the development and management of EdNA moved from collaboration to cooperation then to coordination.

Interestingly, collaboration was not evident in the projects within the EdNA initiative that did not proceed. A telecommunications project, for example, did not have a common purpose among the Commonwealth and States; the Higher Education Committee did not have a common agreed purpose; the training sector in developing an alternative service did not have shared goals, processes or decision making with EdNA and a commercial materials initiative, although initiated collaboratively, when implemented did not have shared goals and processes because the States wished to compete for commercial gain.

What can be noted from the above is that collaboration can operate at the most senior level or among online users when new and challenging issues that are predicted to have a wide impact are harnessed through strong leadership. What was also clear was that collaboration is engaging but does require considerable time to take into account all of the necessary feedback, ideas and contributions as well as a high level of negotiation and diplomacy. Collaboration was also demanding and exhausting even though it did harness a diversity of thinking by engaging the States as stakeholders. In addition, collaboration did appear to create an expectation of a continued mode or a value of how to work together. Overall, collaboration did not appear to be a mode of operation that could be sustained over long periods of time, as can be seen from the EdNA initiative, due to its demanding and exhaustive processes although the persistence of the value of collaboration may have been an advantage as new developments arose.

Policy outcomes

The case study of EdNA, its likelihood of success, its adoption by users and the collaboration that occurred has highlighted the confusion of the application of the terms collaboration, cooperation and coordination. When EdNA was initiated in 1995, the term collaboration was used to describe the process of working together when in fact, during EdNA's most innovative period, from 2002 to 2009, the development of EdNA operated through coordination lead by Education.au Limited. The collaborative period was useful for the establishment of EdNA and lasted until 2000, a five year period, when the national groups sought a wider agenda in

educational technology and moved to a mode of cooperation until 2002 and from then on coordination until the demise of EdNA in 2010.

The cross sectoral nature of the EdNA initiative was important because of the wide diffusion of EdNA as well as the harnessing of diverse thinking and expert skills sets. Based on the observations of the establishment of EdNA, national ICT in education projects require cross-sectoral, inclusive collaboration with strong high level leadership and would appear to mature in five years. However, to suggest that collaboration be maintained for five years does not take into account the antecedents of the likelihood of success. These include the relative advantage of the innovation, the compatibility with existing culture and systems, the capacity to trial the innovation, the observability, the complexity, the support available, and the extent of modification or reinvention of the innovation.

Three issues for planning educational policy arise from this observation. The *first* is that, to establish a national educational initiative, especially in the use of ICT, then collaboration through strong, high level leadership would result in a greater likelihood of success. *Second*, it appears to be critical for national initiatives to be inclusive and responsive. The EdNA initiative included all three levels of education (schools, training and higher education) as well as the three sectors of schooling (State, Catholic and Independent). The EdNA collaboration had an inclusive nature with shared leadership, goals, decision making and communication, harnessing relevant skills, intelligence and thinking. *Third*, however, those responsible for funding need to recognise that, collaboration and cooperation while beneficial to outcomes, are expensive ways of operating, and need to be resourced and funded accordingly.

4. Conclusions

This paper has provided a brief overview of selected aspects of the initiation and development of Education Network Australia (EdNA). Space precluded the exploration of many more issues such as, for example, teacher professional development and pedagogical support. The dynamic nature and complexity of harnessing digital technologies for the benefit of learners and teachers make this an exciting and challenging area in which to work and research. This complexity is nowhere more evident than in the final years of EdNA.

By 2007, for example, the priorities for education and training in Australia had changed, as had the context within which learners and teachers were operating. The dominance of Google as a search engine and other popular web based and social networking cloud services had entered into the mix of useful digital educational services. These may have had an effect on the use of EdNA by educators, although unlike EdNA resources, they had not been checked for quality and relevance to education.

In addition, the focus of national collaborative efforts had shifted towards the development of national curricula and national teaching standards. The existing national curriculum body and Education.au Limited were merged to form a new entity called Education Services Australia (ESA). The role of ESA was to service the national curriculum and professional learning for teaching standards. EdNA was shut down as an online service in 2011, although two of EdNA's online community functions were transferred to another online service (which closed a year later). There are now a range of state services available for Australian educators and even more public and free online services operating in the cloud, all of which can have some use in education and learning.

EdNA as a collaboration and as an online service had served the purposes of building a national online knowledge base and skill set in education, and this contributed towards the capacity of the states to move forward confidently. A set of technical standards were in place and online communities of educators had formed, although with the closing of EdNA, these were dispersed. Regrettably, much of the research, the documents, the presentations and the reports that emerged during the fifteen years of EdNA's development and operation were not archived and have now been lost to posterity. However, there is much to learn about archiving electronic resources and non-commercially published digital materials and resources. The preservation and storage of national digital education resources may be an area for future national collaborative endeavour.

Annex 1: Timeline: Summary of EdNA key events

The following table lists the key events in the governance, collaboration, formation, planning, development, innovation, management and demise of EdNA.

Date	Key event	Responsible body	EdNA outcome
1980-1989	Computers in schools as stand alones	Individual schools with some education system support	Computers regarded as peripheral
1989	World Wide Web first devised	CERN Switzerland	Graphical interface
1991-1996	Reports	Commonwealth Government department of education and training	National concern about harnessing communications technology for education
1993	Open Learning Technology Corporation (OLTC)	Ministerial Council for education and training	First national effort to harness communications technology for education – brokerage and clearinghouse
1994	Networking Australia's Future: Final Report - recommendations for education and training	National department of communications, broadband report	National education department considers possibilities for sharing resources
1995 (April)	Announcement of a national education network	Minister Crean, Federal Government minister of education	Australian Education Network announced
1995 (May)	Agreement by States	National Ministerial Council	States to participate in EdNA
1995	Formation of national Dept of Education EdNA Taskforce	National education department	EdNA development begins
1995	OLTC to be expanded and restructured to govern EdNA	National Ministerial Council	Consultations with States about EdNA directions for development
1995	Network Business Requirements Reference Group (NBRRG) formed	National Ministerial Council	EdNA business requirements
1995	Reception Infrastructure Reference Committee	National Ministerial Council	Reception infrastructure (computers) panel contract
1996	EdNA Reference Committee (ERC) started	National Ministerial Council	Consultations with States about EdNA formalised
1997	OLTC restructured to manage EdNA	National Ministerial Council	National agency is refocussed
1997 (November)	EdNA launched	National education dept	EdNA Online service goes public
1997	EdNA Metadata Standard v 0.03 agreed	National Ministerial Council	First technical interoperability agreement
1997	National education department becomes a member of the IMS standards body in the US	ERC, National education department	Adopt and adapt international standards
1998	OLTC becomes Education.au Limited	Education.au Limited Board	New image and identity

1998	EdNA hardware management transferred to Education.au Limited	National education department and Education.au Limited	Signed June, delivered August
1998	EdNA Metadata Standard v 1.0 approved	ERC	Adopted by States, sectors and Commonwealth
2000	Online forums Introduced	Education.au Limited	Online communities diversify from Listservs
2001	States able to download and use EdNA apps	Education.au Limited	Embed EdNA in local services
2001	ERC changes to Australian ICT in Education Committee (AICTEC)	AICTEC	Broader strategic national role
2002	Education.au Limited forms internal EdNA Online Reference Group formed	Education.au Limited Board	Representative consultation about EdNA's progress and annual plans for development.
2003	EdNA Federated search	Education.au Limited	Access to large databases in real time Capacity for users to customise their usage
	MyEdNA customised service		Personalised online services
2003	EdNA Groups initiated from Forums	Education.au Limited	Web 2.0 based
2004	EdNA shared Information Services introduced	Education.au Limited	Consolidation of news and distribution services with new services
2004	EdNA Groups trialled	Education.au Limited	Success
2005	EdNA Groups launched	Education.au Limited	Rapid take up and formation of online communities
2006	EdNA personalised services initiated	Education.au Limited	Starts as 'My' EdNA with limited services
2008	EdNA personalised services launched	Education.au Limited	Launched as 'me.edu.au'. Rapid take up and formation of online communities based on interests
2009	Minister's Council announces national curriculum and technology agencies to merge	Education.au Limited (technology) and Curriculum Corporation (content)	Two national education coordinating agencies to become one national body
2010	Newly formed company to be called Education Services Australia (ESA)	ESA	One national agency for both content and technology
2011	EdNA website shut down - EdNA listservs and EdNA groups transferred to ESA	ESA	
2012	EdNA listservs and EdNA groups shut down	ESA	All EdNA services completely shut down December 2012. National technology agency completely closed.

Annex 2: Organograms

Three organograms are included in this annex. The first is the national collaboration to which Education.au Limited and its work on EdNA was responsible. The second is the internal governance and management of Education.au Limited in its oversight of EdNA. The third is the audience, relationships, services and data flows for EdNA Online.

diagram 1: National collaboration

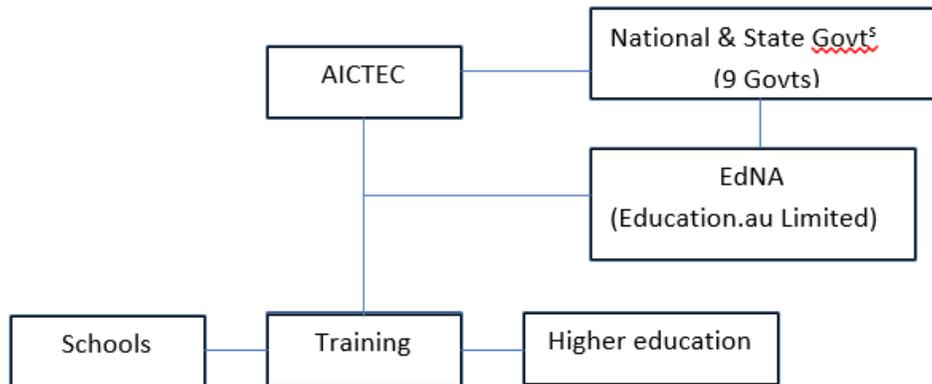


diagram 2: Education.au Limited management of EdNA

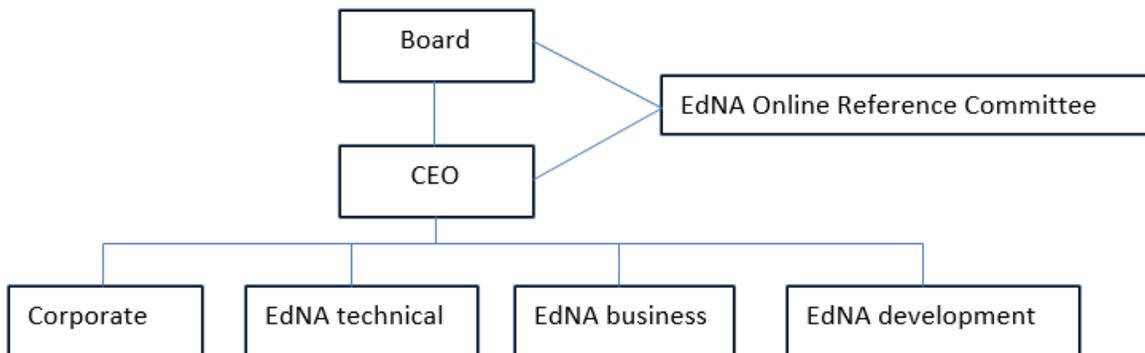
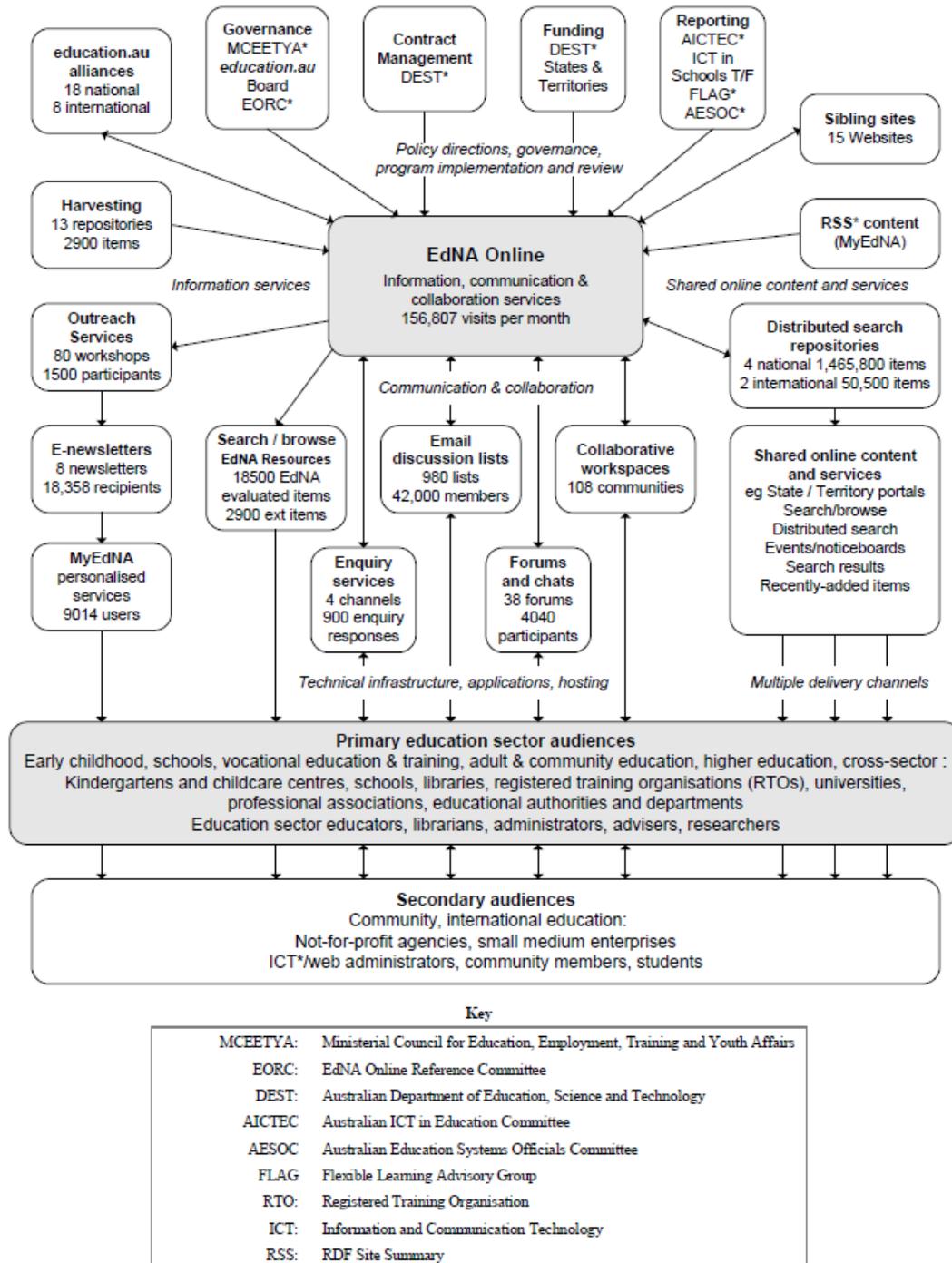


diagram 3: EdNA Online relationships and data flows

The above information has been taken from an internal document, *Demand and Value Assessment: EdNA Online Evaluation for the period October 2003 to September 2004*.

EdNA Online audience, relationships, services and data flows for the evaluation period October 2003 – September 2004 are summarised in the following diagram:



The above information has been taken from an internal document, *Demand and Value Assessment: EdNA Online Evaluation for the period October 2003 to September 2004*.

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This paper draws heavily on the following resource:

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In addition, the following publication was quite useful:

Australian Government. (2011). *Review of Funding for Schooling*. Canberra: Australian Government.





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