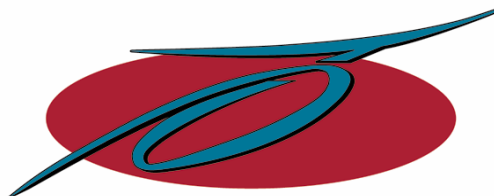**ePortfolio**
Introduction, Applications and Implications
Beyond the Classroom

Prepared by
Dr. Kathryn Chang Barker

FuturEd Consulting Education Futurists Inc.
Dr. Kathryn Chang Barker, President
101 – 1001 W. Broadway, pod 190
Vancouver, BC
Canada V6H 4E4

phone: 250-539-2139   *fax*: 250-539-2129
e-mail: kbarker@futured.com   *website*: www.FuturEd.com

1. Introducing the ePortfolio

An ePortfolio is an electronic portfolio or record of learning acquired from all learning environments – a digitally created and managed archive of acquired skills and knowledge. The term "learning" is used as shorthand for "a body of acquired skills, knowledge and abilities (SKA) resident in either an individual or a community." The term "electronic" is used to imply the use of a computer, particular software or tools, and, often, the Internet.

The ePortfolio is formally defined as "a collection of authentic and diverse evidence, drawn from a larger archive representing what a person or organization has learned over time on which the person or organization has reflected, and designed for presentation to one or more audiences for a particular rhetorical purpose"[1]. Therefore, the term ePortfolio is shorthand for two items – the digital archive and the presentation drawn from it.

The term ePortfolio is also shorthand for both process and product. ePortfolio tools help creators to identify and reflect on the outcomes of learning experiences. Creators can be individuals, organizations, even businesses – and they can be the receivers/processors as well. The process for creating an ePortfolio is for an individual or a group of individuals to focus on experiences and draw from them statements and evidence of the acquired learning and culture. Explicitly, for ePortfolio experts, the ePortfolio development process includes identification, collection, selection, reflection and presentation of evidence of learning and culture. These are the steps that are followed to create an ePortfolio – archive and/or purpose-driven presentation.

1.1. ePortfolio Purposes

An ePortfolio can be created and used by individuals, communities and/or organizations to archive and share learning and culture acquired from informal, non-formal and formal learning environments; provide evidence or verification of learning in a dynamic, multimedia fashion; manage personal and collective learning to maximize usage and to plan; and showcase or promote particular assets as required.

Looking at the history of the ePortfolio, as sweeping generalizations, it has been used in:
- primary and secondary education as a tool for demonstration of learning;
- in higher and post-secondary education for the assessment of learning;
- lifelong learning to enable continuous "reflective" learning and to inventory all types of learning;
- the workplace for the recognition of work experience and workplace training, for recruitment and targeted training, and for career advancement;

---

[1] As defined by the National Learning Infrastructure Initiative (2003).

- eLearning for Learning Management Systems and Knowledge Management through both online tools and web-based services; and
- organizational and/ or economic development through asset mapping and quality assurance.

FuturEd has studied and promoted the ePortfolio since 1997. FuturEd research demonstrates that the ePortfolio is linked closely with:
- Human resources development and **Human Capital Management** – as the means of identifying and managing what a person and a group of persons knows and can do;
- **lifelong learning** – as the method of tracking and recognizing ongoing learning, as an incentive to the lifelong learning requirement;
- **Prior Learning Assessment** – as the outcome of the PLA process of exploring and determining an individual's non-formal and informal learning;
- **education and training at all levels** (K-12, PSE and workplace) - as a teaching tool (reflection as a basis for learning), as a learning management tool (e.g., project-based learning) and as an alternative form of learning assessment;
- **eLearning** – as a type of Knowledge Management, a part of a Student Information System and a potential form of "Usable Learning Object" repository;
- **learning organizations** – as a means of tracking and developing human capital and assisting professional development of employees within organizations across sectors;
- **community economic development** – as an inventory of collective community human capital assets;
- **future learning systems** that rely less on credentials and more on competencies;
- **cultural archiving**, through digital storytelling, of traditional and indigenous wisdom; and
- **social capital** development and utilization, i.e., the value of social networking through such tools as ELGG..

Numerous White Papers and research papers are found in the FuturEd eLibrary. FuturEd has concluded that the term "ePortfolio" is used to encompass (1) tools, products and systems that can be used by (2) individuals, educators, employers and entire nations for the purposes of (3) describing, assessing, recognizing and using knowledge and skills acquired (4) through all forms of learning – informal, formal, non-formal, accidental and incidental (5) with evidence that is digitally created, stored and managed through (4) practices that meet standards assure transportability, usability, and security.

1.2. ePortfolio Types

Basically, there are three types of ePortfolios – standards-based, showcase, and social networking. Many schools, institutes and training agencies are now requiring students to generate and use ePortfolios. In British Columbia, ePortfolios are used by students to demonstrate and showcase competencies outside the academic curriculum, for example, the competencies required for active citizenship.[2] In other jurisdictions, students create ePortfolios of their learning in academic programs to show progress and achievement in a course or program against stated learning outcomes – matching achievements against standards. In schools and outside school, students comment on each others work and lives using social networking ePortfolio tools. The most common use of ePortfolio is in the education environment, but all three types have applications in and between employment and learning environments. At it's most simple, an ePortfolio may resemble a personal homepage or an electronic resume, and at its most complex, it may become a person's digital identity.

ePortfolio types and applications have been developed from very different perspectives and applications, for example:

- digital storytelling tools to record changes, achievements and cultural artifacts by children, families and communities;
- learning assessment tools to demonstrate expected learning outcomes by students of all ages;
- digital inventory tools to assemble and display capabilities, with supporting evidence, by artists, athletes, businesses, agencies or communities;
- reflective learning tools to promote and support individualized learning through the thoughtful examination of experience;
- electronic tools for authentic assessment of learning in non-academic areas, workplace experience or informal training;
- management tools for student information systems and knowledge management systems;
- cultural archiving and media exploration by Aboriginal communities;
- quality assurance tools for comparison of product quality to standards of excellence or professional standards of accreditation.

Until recently, ePortfolio tools focused largely on the presentation of information, with an archive of digital data that derived from the associated purpose of the presentation, i.e., the archive was created with the purpose in mind. However, new ePortfolio tools include digital environments for assembling and managing documents and all forms of media in a digital archive, and/or software applications for assembling and sorting portions of that archive for a particular purpose, e.g., applying for a job or seeking course credit. In the future, the archives will come first, with ePortfolios created when and as needed.

---

[2] For more information on this initiative, please see http://www.bced.gov.bc.ca/graduation/portfolio/welcome.htm.

In summary, ePortfolio tools help creators to identify and reflect on the outcomes of learning experiences, to produce archives and presentations, made particularly appealing through use of multi-media, e.g., audio files to demonstrate language or musical competence, video files to demonstrate skills such as welding, social networking and blogging to establish references.

1.3. ePortfolio Tools and Services

A growing number and variety of ePortfolio tools and services are available online, categorized broadly as either education based or employment based. In the education and training realm, some institutions are choosing to build bespoke ePortfolio tools, while others choose from among some of the following samples.

- Avenet's *e*folio[3] is a Web-based portfolio management system that enables students, professionals, educators and others to organize, manage and display career and educational information to advance educational and career objectives. Membership in the Learning Innovations Forum d'Innovations d'Apprentissage (LIfIA)[4] includes access to a career ePortfolio through Avenet, and FuturEd will be conducting research on this international ePortfolio initiative[5] as it relates to the ePortfolio 2010 initiative.

- Epsilen Portfolios[6] is a comprehensive Electronic Portfolios Management System designed and developed at the Indiana University UPUI CyberLab. Epsilen Portfolios offers a Web environment for students, faculty, alumni, and professional individuals to build personal portfolios. While it is designed for the academic environment, it is adaptable to the workplace.

- Nuventive's iWebfolio is a flexible, Web-based personalized portfolio with the power to store and present a lifetime's worth of experience. Individuals can use iWebfolio to easily create an unlimited number of customized portfolios for school, job applications, or any use imaginable, while controlling who sees specific portfolio information. Because iWebfolio is viewable with any standard browser, authorized users can access portfolios anytime, anywhere in the world.

- ELGG[7], a social networking platform developed out of the University of Edinburgh. ELGG is an open source learning platform quite different from the portfolio tools listed above; it is similar to MSN My Space[8] in that it is a place where a person establishes his/her identity, then reaches out to share with others. As such, it is linked to social capital rather than human capital management.

---

3 Complete information is available at http://avenetefolio.com/
4 Go to www.lif-fia.org for membership information.
5 See the press release at http://avenetefolio.com/index.asp?Type=B_PR&SEC={6D124B20-C790-4A0A-8FBC-0A7927A450BC}&DE={2A8D84FA-A089-4DD3-9203-EC70C400AF6F}
6 Complete information is available at http://www.epsilen.com/
7 Learn more at www.elgg.net
8 Learn more at http://spaces.msn.com

These are but a small number of the ePortfolio services available; they are mostly developed for the academic environment but adaptable to the workplace. For example, Chalk and Wire[9] is a Canadian ePortfolio service with applicability in the workplace. Says Geoff Irvine from Chalk and Wire, "Companies with a strong training ethic and commitment to employee growth both through company derived training opportunities, and those generated by "self-starter" employees seeking to improve their skills, could easily use the tools. The employees do not have to know anything about technology to develop their portfolio, so there is little or no learning curve and lost productive time. They can have many portfolios of any look and feel they choose for different contexts: performance reviews, promotion interviews, job searches. On the HR administration / leadership side, the assessment tools allow the aggregation and disaggregation of professional development data across the organization in a few clicks. Patterns in professional growth and weaknesses in professional practice within the organization are quickly made obvious causing performance differences and move to target and fill the gaps. There is also a full survey tool that allows them to query employees at anytime." In the context of human resources recruiting, training and development, ePortfolio tools are harder to find because they are labeled differently, e.g., eRecruitment, career transitions tools, Prior Learning Assessment portfolios, and electronic labour exchange.

In summation, in learning and employment environments, the ePortfolio may be used to advantage in:

- Community networks and community learning networks;
- eLearning and uses of ICT in education, training and human resources development;
- Application of and access to broad-bandwidth technologies and possibilities;
- Community asset accounting, social capital and community economic development;
- Human Capital Accounting and the management of Knowledge Workers;
- Prior Learning Assessment and the recognition of all forms of learning;
- Innovations in learning systems and HRD;
- Volunteer and staff recruitment, development and management;
- Professional communities of practice and virtual communities;
- Community and enterprise branding and competitive advantage;
- Strategic planning and change management;
- Quality assurance of products and services.

---

[9] Complete information is available at http://www.chalkandwire.com/eportfolio/

2. ePortfolio Applications

Although we typically think of ePortfolio creators as individuals, ePortfolios can be created and utilized to advantage by groups of people. For example, ePortfolios can be used by:

- businesses and agencies, as a means of tracking and developing the collective human capital and assisting professional development of employees within organizations across sectors;
- communities, either virtual or real, as an inventory of collective community human capital assets for, e.g., community economic / social development;
- cultural groups, as digital storytelling for cultural archiving of traditional and indigenous wisdom;
- enterprises, as a means of assessing and demonstrating quality of products and services in a standards-based and transparent fashion.

Both individuals and communities of all type can use an ePortfolio to:

- Archive learning acquired from all forms of learning in an inclusive, objective manner;
- Provide evidence or verification of learning in a dynamic, multimedia fashion;
- Manage Human Capital Assets (skills and knowledge resident in humans) for and by themselves to, first, maximize usage of acquired learning and, second, conduct gap analysis to target required assets; and
- Showcase or promote particular assets as required.

2.1. ePortfolio and Non-formal / Informal Learning

In the context of non-formal learning, the ePortfolio is a means of assessing and recognizing knowledge and skills acquired through community and family responsibilities, workplace experience and training, travel and leisure activities. In this sense, it is related to policies and practices associated with lifelong learning, prior learning assessment, and learning organizations.

In the context of lifelong and lifewide learning, the ePortfolio is a means of tracking and recognizing ongoing learning, and thereby an incentive to the lifelong learning requirement in contemporary society and the Knowledge-based workplace. The promotion of lifelong learning has been a pre-occupation of governments and government policies worldwide.

One specific practice aimed at promoting lifelong learning is the assessment and recognition of "prior learning."   The practice has a variety of labels – PLA/PLAR in Canada, RPL in the UK. The promotion of PLA/PLAR has been a more recent government preoccupation, and the practice is growing in most industrialized countries. In this context, the ePortfolio is a product or outcome of the PLA process of exploring and determining an individual's non-formal and informal learning.

2.2. ePortfolio in Formal Learning

In education and training at all levels – elementary and secondary, adult and higher education, and workplace training, the ePortfolio can be:

- a teaching tool (reflection as a basis for learning),
- a learning management tool (e.g., project-based learning); and
- an alternative form of learning assessment.

ePortfolio tools – with interventions by teachers or mentors - help creators / users to identify and reflect on the outcomes of learning experiences. In the context of formal education and training, the Portfolio has the capacity to be a learning tool, an assessment tool, and a record of achievement. It is inherently motivational in that it focuses on what the person can do, rather than what s/he can't, as measured by standardized tests. In fact, portfolio assessment and portfolio learning are common practice in primary literacy education, and in adult literacy and basic education programs. For example, in Cape Breton, adult learners and their tutors use a paper-based process to demonstrate learning.[10] To portfolio assessment, the ePortfolio adds the electronic dimension that enhances the storage size and updating capabilities of a paper-based portfolio.

Portfolio assessment combines many innovations in the appropriate assessment of learning, i.e., alternative assessment, authentic assessment, competency-based assessment, flexible assessment, and standards-based assessment.

- Alternative assessment refers to alternative means of enhancing educational assessment through, e.g., confidence measurement, analysis of self-awareness, and performance evaluation.[11]

- Authentic assessment involves examining students' basic skills, control of information, high level of understanding, personal characteristics, and habits of mind;[12] and allows students to participate actively in their own learning.[13]

- Competency-based assessment is the assessment of competence against standards set for knowledge and skills in a particular area, typically used in vocational education and professional certification processes.

- Flexible assessment can include checklists, portfolios, performance tasks, product assessments, projects and simulations; observation of the learner, questioning, oral or written tests and essays, projects undertaken in groups or individually, role playing, work samples, computer-based

---

[10] Available at http://www.nald.ca/cbln/projects/dsuccess/dsuccess.pdf
[11] Improving Educational Assessment by Incorporating Confidence Measurement, Analysis of Self-Awareness, and Performance Evaluation: The Computer-based Alternative Assessment Project (Paul, 1998) at http://www.jodypaul.com/ASSESS/
[12] Portfolio Assessment and the New Paradigm: New Instruments and New Places (Engel, 1994) on the ERIC website at http://www.indiana.edu/~eric_rec/ieo/bibs/portfoli.html
[13] Becoming Reflective Students and Teachers with Portfolios and Authentic Assessment (Paris and Ayres, 1994) on the ERIC web site at http://www.indiana.edu/~eric_rec/ieo/bibs/portfoli.html

assessment; and flexible assessment is intended to suit the learner's pace and style of learning and assess the individual when s/he is ready.

- Standards-based assessment is intended to measure achievements against stated learning outcomes or objectives.

Combining elements of all these, portfolio assessment involves using the products in a portfolio as the evidence of learning for assessment purposes.[14] This is the most predominant use of the ePortfolio in formal education.

2.3. ePortfolio in the World of Work

In the world of work, portfolios have been used for years – artists create portfolios of their work, teachers require students to create portfolios for assessment of learning, investors create portfolios for asset management. In this sense, the "e" simply removes a mammoth amount of paper and allows for continuous updating of the portfolio through digital technology.

In the workplace environment, trainers and HR specialists have been using both portfolios and eLearning for some time. Quite naturally, the electronic portfolio – ePortfolio- is a combination of the two, but it introduces unique advantages. First, the "e" provides an opportunity for mediated evidence of competencies in the archive – digital audio, video, artifacts and hyperlinks. It is a living document that individuals can add to or modify on a regular and immediate basis, in creative and highly sensory ways. A second advantage is the incorporation of reflective learning. An ePortfolio embodies both the process of reflecting on learning experiences and the product of verifying claimed learning outcomes. The ePortfolio tool is a semi-structured framework for reflective learning in that it goes well beyond filling in blanks in a database like the conventional resume form. A third advantage is that the same tool can be used by individuals, businesses, organization and/or communities – real or virtual. Each will use the same processes of collection, selection, reflection, projection and presentation;[15] and their purposes may be relatively the same: the self-examination and communication of knowledge and learning assets. The fourth advantage is the focus on learning – actual competencies, rather than credentials that serve as a questionable proxy for competencies.

There are several types of portfolios, based on purpose. Helen Barrett – the world's leading proponent of the ePortfolio in teacher education and in the K-12 sector – distinguishes between various types: working, assessment, demonstration and presentation portfolios. In the corporate environment, the most useful type of ePortfolio will be a standards-based demonstration portfolio, i.e., an ePortfolio tool or system that allows the individual to map his/her skills and knowledge against a "standard" bank of professional or

---

[14] For more information, please see ePortfolio for the Assessment of Learning, a FuturEd White Paper at http://www.futured.com/documents/FuturEdePortfolioforAssessmentWhitePaper.pdf

[15] For more information, see http://www.helenbarrett.com/ALI/intro.pdf

occupational competences. This type of ePortfolio tool assists the individual to assert types and levels of competences, and most importantly, to provide the evidence.[16] There are a lot of applications of this type of ePortfolio, particularly in teacher education and continuing professional development, for example:

- Standards-based ePortfolio for teachers at the University of Iowa;
- Performance support for teachers who use ePortfolios by Concordia University;
- ePortfolios for teachers in the UK through the Centre for British Teachers.

FuturEd and others have researched the application of ePortfolio for skilled immigrants as an alternative to the cost and complexities of foreign credential recognition.

In the corporate environment, and in the context of eLearning, the ePortfolio can meet the needs of (1) employers, (2) HR managers and trainers, (3) individual employees, (4) professional associations and agencies, and (5) entire business enterprises. Employers are continuously looking for new staff, and the task of recruiting and selecting the right employees is often difficult, expensive and risky. The ePortfolio can increase effectiveness and efficiency of the hiring process by providing more and more relevant information about individuals seeking employment. Beyond the reliance on credentials, the employer is able to determine additional and specialized competences – human capital – of individuals. Online recruitment agencies are encouraging ePortfolios to prove resume claims.[17] In order, however, for the employer to find the ePortfolio useful, there must be a system of "production and consumption" – a common tool used by both employer and applicant to match required competences to acquired competences. Such systems are currently under discussion, with considerable effort being directed at engaging employers in the process.

HR managers and trainers use tools to encourage and manage training in the workplace. The ePortfolio is an ideal tool for managing learning because it requires the personal involvement of trainees, thereby increasing motivation and personal responsibility. It is the ideal tool for trainers because it (1) focuses training on intended outcomes; (2) allows for alternative methods of assessment of learning; and (3) targets training through mediated skills gap analysis. And it is a critical tool for eTeachers and eTrainers. The Open eLearning Quality Standards[18] – consumer-based eLearning quality standards that guide the development and evaluation of eLearning products and services – require that good eLearning begin with "prior learning assessment" and conclude with a method by which a person can add new competences to his/her acquired bank of competences. The recognition of prior learning puts value on learning from work experience and informal training, in addition to formal training; and it is the beginning point for many education and training specialists.

---

[16]   Step-by-step information is available at http://www.helenbarrett.com/portfolios/howto/index.html
[17]   For example, see http://content.monstertrak.monster.com/resources/archive/jobhunt/portfolio/
[18]   The OeQLS are available at http://www.lifia.ca/en/learn_equal_proj_oeqls.htm

Individuals will appreciate the opportunity to create their own digital archives and ePortfolios. In the workplace environment, they will have the opportunity to (1) create a complete inventory of skills and knowledge; (2) provide digital evidence to support assertions; and (3) reflect on their varied opportunities to learn. Their ePortfolios will be used to show skill development and diversification over time to support promotion, to identify skill gaps and to aid career planning. The ePortfolio becomes a new type of résumé for the Knowledge Economy.

Characteristic	Traditional Résumé	ePortfolio
content	lists of credentials and work experiences (with skills and knowledge implied)	lists of skills and knowledge (with learning experiences and credentials referenced where appropriate)
development process	keep track of formal credentials, dates, employer addresses, job descriptions	examine learning experiences for the skills and knowledge acquired
perspective on learning	learning happens largely in formal institutions, and credentials and work experience are the valued learning opportunities	learning happens in both formal and non-formal situations, and all learning has value
format	short and factual	may be more comprehensive, with broader lists that can be cross-referenced with actual skills and knowledge in job and training requirements
validation	credentials and employer's references have been unchallenged proxies for learning	different forms of validation are required, in addition to credentials and references, e.g., personal references
purpose	To get a job	for career planning and development: appropriate work and/or training

Professional organizations will use the ePortfolio to assess and certify bodies of skills and knowledge. They are particularly eager to use ePortfolio to assess foreign qualifications and work experience, where (1) formal credentials are difficult to verify and/or (2) applicants do not have recognized credentials but extensive practical experience. In an era of "skills shortages," this is a major concern of employers, industries and entire countries. In the academic sense, this is Human Capital Assets Management (HCAM).

Finally, entire businesses can create an ePortfolio of products and services for quality assurance, strategic planning and/or marketing. Their ePortfolio can demonstrate to clients that they are learning, continuously improving and responsive to customers needs.

3. ePortfolio Implications

The concept of an ePortfolio has been most advanced in formal education and training. However, it has implications well beyond how it is used in the assessment of learning, i.e., for human and social capital development, for the next generation of eLearning and the new management of learning.

3.1. ePortfolio for Human Capital Assets Management

The rationale behind the development of ePortfolio in the workplace rests in the problems associated with developing and managing human capital assets for the globalized Knowledge-based Economy (KBE). Workers of all types are becoming more mobile, while most credentialing and professional accreditation bodies are geographically-bound. This dilemma results in a need to find ways of promoting transferability and transparency of credentials, together with stimulating lifelong learning for the KBE.

The concept of Human Capital Assets Management (HCAM) has been explored and developed by the OECD and FuturEd as a means to understand and implement the necessary adaptations individuals and nations must make to measure and utilize knowledge assets – knowledge resident in human beings – in relation to economic performance and prosperity. The implementation of HCAM is an OECD-recommended means of improving the efficiency of human capital investment and utilization. In 1996, the OECD concluded that public policy must focus on the development of better signals for competence validations, valuation, accounting and financial reporting. Firms had begun to think of employees as investments rather than costs, and as the cost-to-investment-based thinking evolved, the transition continued towards full accounting of human capital investments as assets that produce returns over an extended period of time. The OECD publications *Measuring What People Know: Human Capital Accounting for the Knowledge Economy*[19] and *Human Capital Investment: An International Comparison*[20] extend the treatment of physical capital to human capital in a discussion of knowledge production, diffusion and consumption in light of the disciplines of economics, accounting and education.

Human capital is defined as *the knowledge that individuals acquire during their life and use to produce goods and services or ideas in market or non-market circumstances.*[21] According to the OECD, this definition of human capital is non-committal about the source, nature or validation of embodied competences; and helps to focus on two issues: (1) the productive capacity arising from knowledge; and (2) the utility of improving the methods for assessing the productive capacity of human capital.   HCM is a method of systematically identifying, measuring and presenting information about the human resources of an organization.   It is related to and sometimes confused with such other concepts as: intellectual

---

[19]   Measuring What People Know: Human Capital Accounting for the Knowledge Economy (OECD, 1996)
[20]   Human Capital Investment: An International Comparison (OECD, 1998)
[21]   Measuring What People Know: Human Capital Accounting for the Knowledge Economy (OECD, 1996), p. 22.

capital,[22] intellectual potential,[23] knowledge management, Human Resources Accounting (HRA), Human Capital Accounting (HCA), intangible investments[24] and/or intangible assets – which range from the intellectual property rights of patents, trademarks, copyright and registered design through contracts; through trade secrets and public knowledge such as scientific works; to the people-dependent or subjective resources of know-how, networks, organizational culture, and the reputation of product and company.[25] FuturEd has concluded that the concept of HCM is also directly related to human resources management in the knowledge economy, lifelong learning, assessment and recognition of prior learning, electronic labour market information, knowledge management, and the electronic learning record or ePortfolio.[26]

The ePortfolio becomes the tool for promoting and managing human capital through lifelong learning. An ePortfolio, in a sense, can become an alternative credential and/or a more accurate statement of qualifications. On one hand, HCM addresses the challenge to the reliance on credentials for employment and advancement. There is a growing body of literature about rampant credentialism and the dubious utility of some academic credentials. The OECD acknowledges that "usually education certificates are used to measure actual competencies, but these achievement certificates are imprecise at best."[27] The OECD foresees a situation where "any new investment in learning will be undertaken with more attention to type, method and content. In other words, quality of education will be more important than quantity."[28] The ePortfolio facilitates, perhaps encourages, the acquisition and recognition of skills and knowledge outside the formal credential-acquisition system. On the other hand, while individuals and all of society are urged to adopt lifelong and life-wide learning, there is an acknowledged lack of incentives other than formal credentials. The OECD asserts that individuals need to be able to see their investments in skill formation as a lifelong commitment to building assets. It has been hypothesized that an ePortfolio, by accurately reflecting an individual's acquired skills and knowledge, could increase access to training, appropriate employment and/or career advancement – ostensibly incentives for some. As noted by the OECD, the continuing emphasis on lifelong learning reinforces the need to reform the information and decision-making mechanisms that determine learning acquisition choices. They recommend that "reforms should take into account, for individuals, their lifetime pattern of investment in human capital,

---

22   Intellectual capital is proprietary information and knowledge that lowers costs or increases customer value; it is human capital plus structural capital such as databases and documents. Examples are patents, trade secrets, copyright protection, trademarks and contracts. An "intellectual capital" reading list is available at http://www.icmgroup.com/biblio.html

23   *The Austrian Approach to the Measurement of Intellectual Potential* (Schneider, 1999) at http://users.austro.net/measuring-ip/OPapSchneider/theoreticalframework.html

24   Intangible investments, in this context, include research and experimental development, training, organizational change, marketing and software.

25   Hall, R. 1992. The Strategic Analysis of Intangible Resources, *Strategic Management Journal,* Vol. 13.

26   For more information on the ePortfolio, see other FuturEd papers, e.g., *The ePortfolio and HRD Policy Goals* (Barker, 2003) available at www.FuturEd.com .

27   Measuring What People Know: Human Capital Accounting for the Knowledge Economy (OECD, 1996); p. 20.

28   *Redefining Tertiary Education* (Wagner, 1998) at http://www.oecd.org//publications/observer/214/article4-eng.htm

and for institutions, the existence of multiple distinct learning pathways and the need for mobility and linkages between them."[29]

In summary, HCAM promotes a different view of knowledge management. Comparing formal credentials to the ePortfolio, FuturEd concludes that while formal academic credentials reflect time spent in class, represent questionable proficiency, are used as a proxy for skills and knowledge, are dated and of variable quality, and include formal learning only; the ePortfolio reflects time spent learning, presents evidence-based proficiency, is a statement of actual skills and knowledge, is "living" and systematic, and values all types of learning. FuturEd calls the ePortfolio the New Management of Learning. Through the ePortfolio, HCM enables the better use of human resources, recognition of foreign work experience and qualifications, more efficient training and increased return on investment in learning, increased productivity, promotion of lifelong learning and development of the eLearning industry worldwide.

To implement HCM and an ePortfolio system, a nation-wide effort may be required. The OECD notes that firms do not have the capabilities or financial means to pursue assessments that are often imprecise or expensive; nor do they have the negotiating experience to allow them to enter into contracts that explicitly validate the estimated value to the firm of a person's acquired skills. "In the absence of nation-wide efforts to establish appropriate and affordable human capital information and decision-making systems, firms are unable or unwilling to develop such systems on their own are likely to suffer from lower productivity growth and reduced ability to compete because they will be less effective and efficient in acquiring and using human-embodied knowledge."[30]   To this end, the OECD acknowledged Prior Learning Assessment as a most promising area of innovation, referring to it as "achievement-based evaluation of human capital accumulation." They note that "explicitly negotiated and transparent links between competence validation and market validation have not yet been made; however…there is a new and growing potential to turn measurement into valuation as new active labour market policies are combined with reform of educational financing and closer ties between learning institutions and the workplace."[31] The ePortfolio is the tool that now makes this possible.

---

[29]   OECD, 1996; p. 73.
[30]   OECD, 1996; p. 54.
[31]   Ibid., p. 59.

3.2. ePortfolio for Social Capital Development and Management

Another way of examining the benefits of an ePortfolio in the context of the workplace relate to the development and utilization of social capital. Social capital is a socio-economic concept with a variety of inter-related definitions, based on the value of social networks.[32] The French sociologist Bourdieu[33] defined social capital as "made up of social obligations which is convertible, in certain conditions, into economic capital."   For contemporary purposes, social capital is the value of social obligations or contacts formed through a social network; and social networks are the medium through which social capital is created, maintained, and used. In short, social networks convey social capital.   For a time in the late 1990s, the concept was highly fashionable, with the World Bank devoting a research programme to it, and the concept achieving public awareness through Robert Putnam's 2000 book, *Bowling Alone.*

Social capital development is particularly important, for example, in the context of skilled immigrants because, on the one hand, they have lost their social networks "back home" and on the other hand, benefit from the creation new social networks in their new country. According to Jacobs (1961), "When social capital is lost, from whatever cause, the income from it disappears, never to return until and unless new capital is slowly and chancily accumulated."

According to Johnson[34] , it would be nearly impossible for humans to exist without the benefits derived from social learning, participation in social institutions (such as family, community, coordinating behaviours, and norms), and information transference. Fundamentally, these activities are a function of interaction. When complemented with accumulated labour, these activities result in the accumulation of all forms of capital. She notes that capital can be embodied in four forms: physical, human, cultural, and social. "The potential complementarity of production of different forms of capital is exemplified in the process of obtaining a degree from a distinguished institution of higher education. It can be assumed that human capital is created on the way to obtaining such a degree. Social capital may be created because classmates may keep up their networks of friendship and reciprocity. Cultural capital may be accumulated in two forms: institutional and embodied. Institutional cultural capital is accumulated because some status or benefit is bestowed on an individual by matriculating at such a distinguished institution. Embodied cultural capital, the ability to participate in society with regard to social or cultural institutions, may be gleaned through repeated interaction with other individuals while in the university environment."

---

32   Definition taken from Wikipedia http://en.wikipedia.org/wiki/Social_capital
33   Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), Handbook of theory and research for the
        sociology of education (pp. 239–258). New York: Greenwook Press.
34   Johnson, C. (2003). A model of social capital formation. SRDC: Working Paper Series 03-01

The concepts of social and cultural capital are abstract, intangible, and oftentimes non-transferable as assets. They both share the necessity for social interaction in their creation and use. However they are fundamentally different in that social capital resides in other people and the embodied state of cultural capital resides within a person, much like human capital. This is one of the two basic functions of social capital: (1) as a source of social control, and (2) as a source of benefits through networks. The most common function of social capital is acting as a source of network-mediated benefits beyond the immediate family, in promoting or achieving access to employment, mobility, and entrepreneurial success. This is the utility, for some, of such social networking tools as weblogs (blogs) and ELGG[35] - "an open source learning landscape platform." As a social networking tool, the ePortfolio is a means to develop social capital: friends, colleagues, and more general contacts to use for financial and human capital development.

3.3. Next Generation eLearning

In the context of eLearning, the ePortfolio is both process and product. It is a type of Knowledge Management for individuals and organizations; a part of a Student Information System for learning agencies; and a potential form of "Usable Learning Object" repository for individuals.

eLearning is one of the newest method by which people acquire learning both formally and informally. Until recently, definitions of eLearning tended to focus more on indirect instruction than the opportunity for unstructured learning. And until recently, we saw the ePortfolio as an element of eLearning. For example, the Open eQuality Learning Standards[36] indicate that an ePortfolio is a necessary part of good eLearning. Now we see that the ePortfolio is what good eLearning should be.

After considerable research and reflection, FuturEd has concluded that the ePortfolio represents the single greatest innovation in the use of learning technologies for the following reasons.
1. The ePortfolio is eLearning at its finest – the best, least complicated, most appropriate use of ICT for learning and learning management on an individual and a societal basis.
2. It is an elegant use of inelegant technologies – using complex technological developments in simple, practical ways. Unlike most eLearning, the ePortfolio tool is typically user-friendly and appealing with great and immediate utility.
3. It is a learning leveler – it can be made accessible to each and every person regardless of skill levels and personal assets, and there is seldom a substantial cost involved. An ePortfolio can be as ubiquitous and equalizing as the Internet itself.

---

[35] Please see http://elgg.net/
[36] *Open eQuality Learning Standards* are available at http://www.lifia.ca/en/learn_equal_proj.htm

4. It focuses on "the positive" – archiving and showcasing what a person knows and can do. The outcome of an ePortfolio is "look what I've achieved!" Rather than being deficit-based, it is asset-based.

5. It can become a complete description of a person's "human capital" – acquired skills and knowledge, including and going far beyond those represented by formal credentials. An ePortfolio incorporates learning from formal, informal, non-formal, accidental and incidental learning environments.

6. It is a more accurate description of a person's "human capital." Being competency-based, it doesn't assume or imply competence or use proxies for learning.

7. For teaching purposes, it builds on best practices in designing, delivering and assessing skills and knowledge. Authentic assessment is a cornerstone of the ePortfolio.

8. For learning purposes, it is appropriate for all levels and types of learners. It builds on best practices in how people learn and shows positive change in the acquisition of new skills and knowledge. Reflective learning another cornerstone of the ePortfolio process.

9. It is equally adoptable in both formal and informal learning situations. Teachers and instructors can use if for alternative assessment of learning aimed at accreditation. Lifelong learners can use it to understand and record ongoing acquisition of insight and competencies.

10. It is endlessly scalable – from the individual to an entire business or nation. This is, in part, because of interoperable technologies and, in part, because of common learning and learning management needs at all levels.

11. It can be both deeply private and universally accessed. While the content of an ePortfolio is the sole property of the person or body creating the ePortfolio, it can be shared by them in many controlled ways or eBroadcast to the world.

12. It is a comfortable means of communication between learners and teachers / mentors / advisors and friends. It is exploratory rather than definitive.

13. It can be a critical transformation tool for learning systems – to outcomes based, learning-centred learning.

14. It enhances creativity and problem-solving. With the ePortfolio, there are many ways to explore and present learning.

15. It can be, at one time, both a teaching and learning tool – with the ePortfolio creator both learning through reflection and teaching through sharing the acquired insight and competencies.

16. It has endless utility to individuals and those they engage with. People of all ages can use it as a personal knowledge management tool, recording achievements, targeting new learning requirements, even making application for advance standing in formal learning environments. Employers can use it to understand and manage an entire workforce of any size, for identifying human resource needs and best utilizing human capital. Communities of place, interest or

practice can inventory entire competency banks and human capital resources for development and marketing purposes.

17. An ePortfolio system can do what computers do best – sorting and matching.
18. The ePortfolio, as a teaching/learning tools, creates a unique balance between structured and unstructured learning. The tools guide but do not limit learners.

For all these reasons, by substituting the ePortfolio for eLearning, different approaches are taken to the implementation of eLearning policies and practices.

3.4. The New Management of Learning

The digital archive is the place to record learning from environments over a lifetime; the ePortfolio becomes a presentation drawn from the archive for a specific purpose. This gives recognition to all forms of learning, and more importantly, the opportunity to **use** all forms of learning for the good of the individual, community, enterprise or nation. A purported ePortfolio that contains only formal learning is a simple digital transcript. The ePortfolio can be an alternative credential for those without formal credentials, such as early school leavers, and for those without recognized credentials, such as foreign-trained workers.   In an era of skills shortages, we can't afford to squander what we've got.

In the past, we've formally managed learning by awarding and expecting credentials; this has been the function of the formal education system and various professional bodies. Employers use credentials as an approximate proxy for acquired skills and knowledge, and have, until now, had few other efficient tools for assessing actual skills and knowledge that individuals represent. We now understand that people acquire skills and knowledge from that formal learning, from informal and non-formal learning in the workplace and the community, from accidental and incidental learning in travel and human relations, but until we had an ePortfolio, we had no tool for manage that learning effectively and efficiently. So my son, who hasn't finished school but who has had a very successful business, is still called a "dropout" in Canada where we continue to think that people without credentials are likely to be stupid or criminal. We need to manage learning differently.

4. A Call to Action

An ePortfolio for Every Citizen! One ePortfolio for Life! Since 2004, these have been the rallying cries of the Learning Innovations Forum d'Innovations d'Apprentissage (LIfIA)[37] and the European Institute for eLearning (EIfEL) in their combined, worldwide advocacy and research efforts.

One ePortfolio for Life means that a person should be able to carry his/her ePortfolio for a lifetime, from school to work to retirement; i.e., there should be no need to recreate one's ePortfolio; there should be return on the initial investment in an ePortfolio. With the rapid proliferation of ePortfolio initiatives and competing interests, there is an urgent need for collaboration between ePortfolio initiatives.

By *An ePortfolio for Every Citizen* we really mean that every citizen should have the opportunity to create and maintain a digital archive – a place on the Internet to collect and use digital materials created by oneself and others, a place to create and manage both social and human capital assets, a place that is owned by the individual, unquestionably secure, and accessible only by whomever the individual allows.

There is no need to choose one ePortfolio tool or approach. ePortfolio tools and services will morph and improve over time, ePortfolio tools will be created and used for a vast array of purposes. There IS a need to create an online environment where all citizens can create, maintain and use their digital identity to advantage. To be effective, it cannot be a commercial service ultimately controlled by business interests, and it cannot be a government service that reminds people of Big Brother; it must an environment managed by a national non-profit agency that cuts across all the separate applications in education, employment, citizenship and community learning. The service must be trusted, professional and accountable to individual users. It must be useful, reliable, and engaging.

In the development of such an ePortfolio environment for all, there are several major issues to consider. First, as with other uses of learning innovations and/or the Internet, the fundamental needs are for awareness and access to the tools, the hardware and the Internet. The "worst case" scenario is characterized as the Digital Divide, and we know that a significant number of individuals do not have access to computers and high-speed internet access. In addition, most people have never heard of an electronic portfolio; hence the need for a great deal of public education.

Secondly, in order for anyone – skilled immigrants, employers, students, whomever – to want to create an ePortfolio, use it and keep it current, there must be some form of Return on the Investment of time,

---

[37] Information available at www.lifia.ca

energy and other resources. Having taken this perspective, a set of quality standards have been created, and we know that, when we choose or develop an ePortfolio tool / service, it must meet these quality standards (Appendix A). When we choose or develop an ePortfolio tool, we know what questions to ask of commercial vendors and designers (Appendix B).

An ePortfolio without someone to receive, process and/or utilize it is like one hand clapping. Clearly, what is needed is a system of producer – i.e., skilled immigrants -- and consumer – i.e., certification bodies and employers. FuturEd has conceived of such a system (Appendix C). From a slightly different perspective, Jafari[38] sets out The ePortfolio Success Algorithm:

> Successful ePortfolio Project = I + J + K + L + M + N + O, where
>
> I = ease of use
>
> J = sustainable business plan
>
> K = advanced features
>
> L = robust integrated technology
>
> M = lifelong support
>
> N = standards and transportability and
>
> O = X (the other, based on situation)

The successful use of ePortfolios and implementation of ePortfolio systems, including digital archives and tools for end-users, will require attention to making them effective and efficient. The first time students are told they can't take their ePortfolios with them to the next level of education or to the workplace, they will question the value of investing time and effort in creating a second ePortfolio. The first time employers receive an abundance of ePortfolio applications for one job, they will question the wisdom of the process. Recognizing the pitfalls, groups of experts are creating technical standards for interoperability and transportability of ePortfolios and digital archives, i.e., removing the barriers. More importantly, ePortfolio experts worldwide have asserted the critical importance of personal ownership of one's ePortfolio, secure storage and access, affordability and utility to ensure ROI.

The ePortfolio has incredible potential to help us promote lifelong learning, recognize and use all forms of acquired learning, manage our digital identities.   Start, I suggest, by creating your own ePortfolio and you'll see what I mean.

---

[38]   Jafari, A. (2004). *The "Sticky" ePortfolio System: Tackling Challenges and Identifying Attributes* published by Educause Resources at http://www.educause.edu/content.asp?page_id=666&ID=ERM0442&bhcp=1

Appendix A

ePortfolio Quality Standards
Prepared by Dr. Kathryn Barker, FuturEd Inc.
April 2004

The following consumer-based quality standards are based on a diagnosis of quality issues and challenge,[39] and created by an international committee of ePortfolio experts.

1. A digital archive and an ePortfolio are developed and owned by the individual or organization creating them. The use of both or either, and any changes to them, are under the control of the individual. Both are confidential and access is controlled by the individual.

2. The ePortfolio system has the capacity to maintain a complete inventory of skills and knowledge acquired by the individual through formal, non-formal, informal, accidental and incidental learning. The ePortfolio development process includes thoughtfulness about learning represented.

3. The ePortfolio system lists and describes skills and knowledge in a way that is recognized and respected by educators, employers, professional bodies, and others who receive and process ePortfolios.   Where possible, the ePortfolio system links to established competency standards but also allows flexibility to accommodate unique or non-specific competencies.

4. The content of the ePortfolio is current, accurate, and verifiable.   Methods of validating learning are flexible, appropriate, and credible.

5. To develop the ePortfolio, there are explicit instructions with examples, a universally-recognized glossary of terms, and professional assistance if required. The ePortfolio is easy to access, use, and modify by the owner.

6. The ePortfolio and archive have the capacity to incorporate a variety of media.

7. The ePortfolio is portable and interoperable in a technical sense.

8. The ePortfolio service is multi-purpose, customisable and adaptable to various uses, e.g., assessment by teachers, learning through personal reflection, planning, individual or community asset mapping.

9. An ePortfolio system is seamless, allowing the individual to create many versions of his/her ePortfolio and use this process throughout life, from primary school through higher education and career training to the workplace and lifelong learning environments.

10. An ePortfolio system provides secure long-term storage, privacy, access and ongoing support.

---

[39] *ePortfolio Quality Standards: An International Development Project* (Barker, 2003) is found at
http://www.futured.com/pdf/ePortfolio%20Quality%20Discussion%20Paper.pdf

In generating these standards, FuturEd appreciates the input and assistance of the following organizations and individuals.

Participating Organization	Representative
AAHE (American Association for Higher Education)	Darren Cambridge
AMTEC (Association of Media and Technical Education in Canada)	Genevieve Gallant
CACE (Canadian Association for Community Education)	Barb Case
CADE (Canadian Association for Distance Education)	Bill Muirhead
Campus Canada (Industry Canada)	Jane Kralik
CanLearn (Human Resources Development Canada)	Karin Fuller
CAPLA (Canadian Association for Prior Learning Assessment)	Sandra Aarts / Bonnie Kennedy
CEA (Canadian Education Association)	Penny Milton
COL (Commonwealth of Learning)	Angela Kwan / Paul West
CSBA (Canadian School Board Association)	Lionel Sandner
ElfEL (European Institute for E-Learning)	Maureen Layte
Licef –TeleUniversite	Karen Lundgren
CERI / OECD ("watching brief")	Kurt Larsen
Additional ePortfolio / eLearning Experts	Helen Barrett Barbara Cambridge Marquis Bureau

Appendix B
Consumer's Guide to ePortfolio Tools and Services
FuturEd, 2004

There are a large number of potential tools and services available, but no one system will meet everyone's needs, so you will have to choose the right one for your agency or business. To make an informed choice, these questions will help draw comparisons.[40]

1. Who is the producer, provider or supplier? What is the organization's history? Does it give you a sense of confidence? How do you contact the head office? How reliable and credible is the product/service? Is there a body of evidence or supporting research? Can you contact references who have bought and/or used the product/service? Does it come with a guarantee or warranty?

2. What information and consumer service is available, and how accessible is it?   Is there any local access in your country or region? Is information easily available? Are demonstration materials available? Do you have a sense of the quality of customer service? Is technical support available – e.g., 1-800-number?

3. What is the intended purpose? Is the ePortfolio focused on assessment process or demonstration product? What is the primary purpose of the ePortfolio, e.g., presentation of achievements, assessment of learning, reflective learning, planning and gap analysis? Does the ePortfolio accommodate all forms of learning, e.g., formal, informal, non-formal, accidental, or incidental? Can the ePortfolio be repurposed, e.g., from an assessment of learning to a record of achievement?

4. Who is the intended purchaser? Is the intended purchaser an education institution, a human resources agency, a business or industry? Does it matter? Is the product or service aimed at a very narrow or very broad audience – e.g., one level of education such as secondary school or assessment of learning at any level? What assumptions are made about the target consumer, e.g., organizational needs for an ePortfolio, funding sources?

5. What staff will be required and involved? For managing the ePortfolio system, who is involved and what are the requisite qualifications? For creating an ePortfolio, who is involved and what are the qualifications? What is the nature and cost of training provided? What is the time and cost to your organization?

6. Who is the intended user? Is the product or service for a general or a specific population – e.g., within a type of industry or with a particular educational level? Is the ePortfolio owned exclusively by the user? What creation process is followed? Is it individualized or conducted in groups? Is external assistance required or advised? Will external assistance be available? Is it accessible to specific populations? What languages is it available in?

---

[40] The complete *Consumer's Guide to ePortfolio Tools and Services* (FuturEd, 2003) is available at http://www.lifia.ca/en/pdf_brochure_consumerguide_v0409.pdf
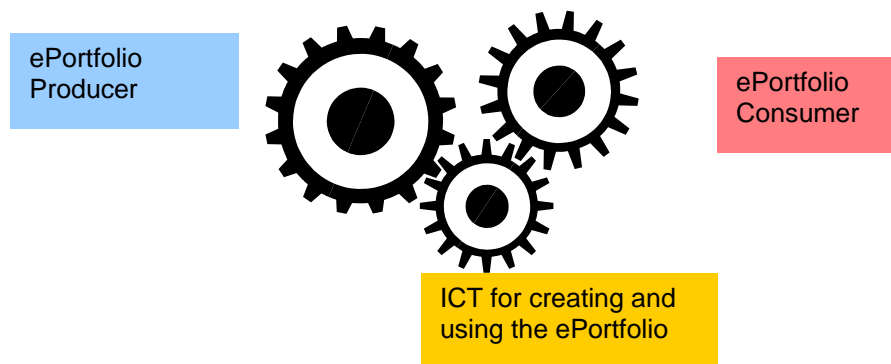
7. What is the difficulty level? Can it be used for people for whom English or German is not their first language? Can it be used by people with low literacy levels? Does it have appeal or application to different age groups – e.g., youth, seniors?

8. What is the nature of the product or service? Is there a product you own, a service to be contracted, or both? What is the type of product – e.g., computer software, web application? What equipment is needed? What general equipment is needed – e.g., hardware? What particular equipment or software is needed? How are you involved in using the product or service? What equipment and facilities are provided? What time will be required of you?

9. What are the end results of the process or service? How usable is the final product to you? What is the degree of technicality? Who owns the information gathered? Are results confidential? What is the nature of the confidentiality?

10. Where is the ePortfolio stored? Are there linkages to existing or needed services such as: training plans or materials? existing management information systems? job classification systems and industry occupational skill standards? education outcomes and reporting systems?

11. Is the product or service "user-friendly"? Is the terminology generally understood or "unique" to the producer? Is there a glossary of terms? What amount and type of information is required in advance in order to use the product or service?

12. Is the product flexible and adaptable? Is the format flexible – e.g., can it be modified or changed at all? Is it adaptable to various industries or sectors? Can it be adapted to different sizes of organization – e.g., small enterprise to multinational firm, an individual school to entire system? Is it relevant to a particular country or adaptable to any cultural context?

13. Is it a "living" tool or service? Has it been updated and/or revised? How often? How recently?

14. What is the total cost? Is there an initial fee and/or annual fee? Are there licensing fees? Does this apply to multiple and/or single sites or users? What are the ongoing costs? What does storage cost? What is the total cost per individual ePortfolio? Are there economies of scale – e.g., reduced cost with increasing numbers? What are the associated purchaser costs – e.g., training, administration time, communications? What are the customizations costs?

Appendix C

FuturEd ePortfolio System ™

For purposes of development of the ePortfolio System, an **ePortfolio** is a digital or electronic learning record, an inventory of a persons skills and knowledge, acquired through formal, non-formal and informal learning experiences, with relevant verification. A **system** is one of production and consumption that makes the ePortfolio useful and used. Therefore, the necessary components of the FuturEd ePortfolio System are **producers, consumers** and **ICT**. In a small number of cases, the producer and consumer may be the same person but the functions remain the same. In all cases, a computer is used for creating and using the ePortfolio in the critical "matching" process; often this involves using the Internet as well.

ePortfolio Producer

ePortfolio Consumer

ICT for creating and using the ePortfolio

ePortfolio producers are the individuals or groups who create or generate their own ePortfolios.

> **Producers may be:**
> - Learners or potential students of all ages
> - Workers and people seeking work
> - Citizens of all ages
> - Communities

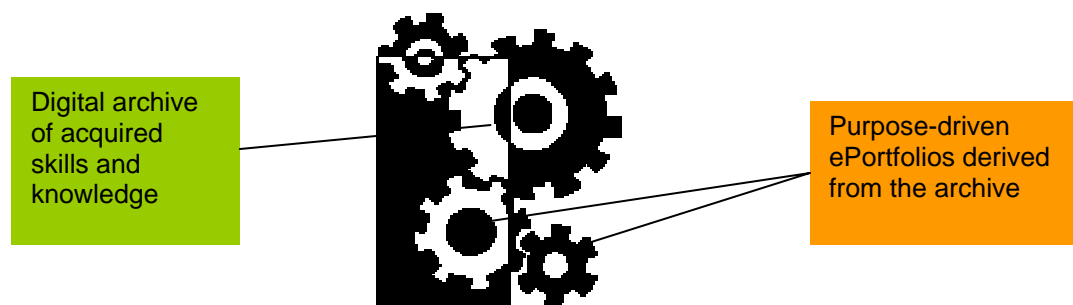**ePortfolio consumers** are individuals or agencies that receive and process ePortfolios.

> **Consumers may be:**
> - Educators, helping students to learn and/or assessing student learning
> - Employers, assessing the suitability of job applicants and/or managing human capital assets
> - Counsellors, assisting individuals in planning for career development and life changes
> - Businesses, choosing from between choices in host communities and expansion sites
> - Governments, creating inventories of human capital and targeting skills development policies
> - Individuals, using their own ePortfolios for self-awareness and planning, e.g., career development.

In the **production process**, a person or community develops and maintains as complete an **archive** as possible; the individual or the group:
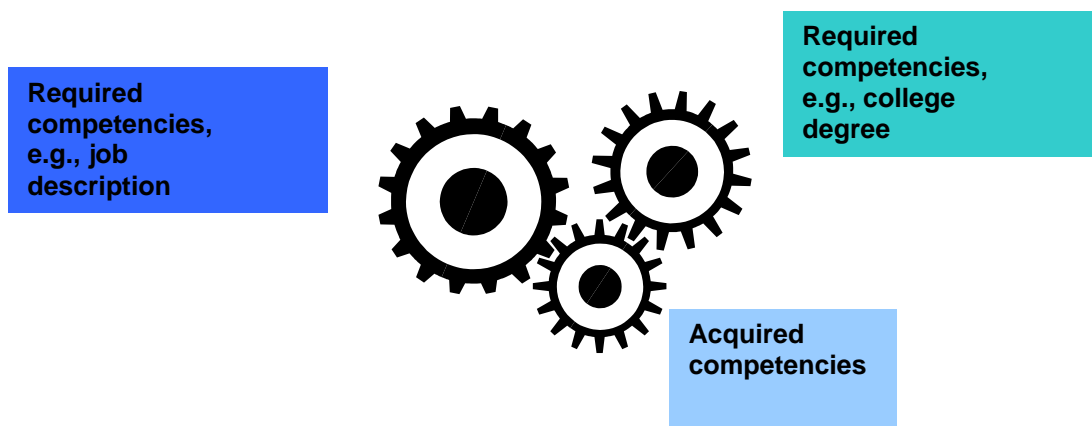
1. Concludes and/or reflects on a learning experience, e.g., an educational course, workplace training, a community or family role;
2. Using a computer, lists **acquired skills and knowledge** (competencies); and
3. Using a computer and/or the Internet, attaches evidence of acquired competencies, e.g., professional credentials, artifacts, references.

From this archive, a person can generate a focused ePortfolio when opportunity or necessity dictates.

Digital archive of acquired skills and knowledge

Purpose-driven ePortfolios derived from the archive

In the consumption process, a person or agency exams the acquired competencies in the context of **required competencies**. For example,

- Education institutions examine registrants for pre-requisites for course or requisites for program completion (to award advanced standing, thereby enhancing efficiency in learning systems)
- Accrediting bodies examine applicants for requisite professional competencies.
- Employers examine applicants for job fit and suitability.
- Trainers examine trainees for competency gap analysis and targeted training.
- Counsellors help individuals examine their own competencies vis-à-vis those required for career development and life changes.

Required competencies, e.g., job description

Required competencies, e.g., college degree

Acquired competencies

The fundamental uses of the ePortfolio, while varied and numerous, are **learning and/or matching** acquired with required learning.

- Students learn through the ePortfolio process of description, reflection and validation of acquired skills and knowledge.
- Students and others learn from the ePortfolio process how to describe and value learning from all types of experiences.
- Students demonstrate learning (acquired skills and knowledge) with relevant verification (text or visual) and educators assess learning.
- Workers demonstrate their employment capacities and/or training needs.
- Individuals and communities showcase what they are capable of with the intent of "winning" a match to someone's expectations.

The entire development and utilization of the ePortfolio is made effective, efficient, and **electronic** through the use of ICT – Information and Communication Technologies:

- Computer-based and web-based ePortfolio creation tools for producers
- Web-based sets of occupational and other skill standards for both producers and consumers
- The **potential** for computer-based or web-based ePortfolio processor tools for consumers to receive and process individual ePortfolios.

In this context, the ePortfolio is related to **eLearning** – as a type of Knowledge Management, a part of a Student Information System and a potential form of "Usable Learning Object" repository. In addition and in summation, the ePortfolio is integrally linked to:

- **education and training** at all levels (K-12, PSE and workplace) - as a teaching tool (reflection as a basis for learning), as a learning management tool (e.g., project-based learning) and as an alternative form of learning assessment;
- **lifelong learning** – as the method of tracking and recognizing ongoing learning, as an incentive to the lifelong learning requirement;
- **Prior Learning Assessment** – as the outcome of the PLA process of exploring and determining an individual's non-formal and informal learning;
- Human resources development and **Human Capital Management** – as the means of identifying and managing what a person and a group of persons knows and can do;
- **future learning systems** that rely less on credentials and more on competencies, making learning systems more effective and efficient.

The implementation of this ePortfolio system requires a wide variety of tools and services, many of which do not exist yet. This provides a significant opportunity for Canada's eLearning industry; it will require significant collaboration and coordination in order to generate a seamless system that is effective and efficient for Canadians, individually and collectively. **FuturEd Inc. has begun work on the ePortfolio system with partners in BC, in Canada and in the European Union. For more information, check the eLibrary at www.FuturEd.com or contact kbarker@futured.com.**