# Guarantee of existence for online information as a precondition for hyperlinked e-portfolios

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**Abstract:**
The idea of providing learners with an „e-portfolio" serving as individual learning room is rightfully considered a significant step towards the realization of the vision of lifelong learning. According to the authors, two aspects, which are usually disregarded when it comes to dealing with technology, presentation of content and software functionalities, need to be taken into consideration. These aspects are the possibility of referencing online information and its reliable availability. This article is intended to present a concept for the definition of guarantees of existence (GOEs).

## 1.  Introduction

The e-portfolio provides students, or rather learners in general, with an infrastructure during their individual learning careers. This infrastructure can be used for presenting and documenting personal learning matters as well as for reflecting on them. In the author's opinion, this rightfully signifies a step towards the realization of the vision of lifelong learning. However, two aspects, which are usually disregarded when it comes to dealing with technology, presentation of content and software functionalities, need to be taken into consideration. These aspects are the possibility of referencing online information and its reliable availability. This is particularly true, if – as opined in this article - e-portfolios are especially valued for their potential as personal rooms for reflexion where external sources are processed (learning material, e-portfolios of other students) and other persons are involved. E-portfolios will only work efficiently if a transparent solution is successfully developed, which controls whether and how long information is preserved (or rather available) and how information can be reliably referenced.

This article provides a possible solution for the problem of reliable availability. The solution is a concept for the definition of guarantees of existence.

## 2.  Problem

E-portfolios aim at the creation of a learning environment which is perfectly adapted to the challenges of a modern, knowledge-based work environment and the acquirement of essential skills and individual competences. The main focus is no longer on the acquirement and the correct reproduction of knowledge but on the learning process itself. In other words, the development of new knowledge by identifiying, using and combining existing knowledge.

An essential part is the element of „social learning" or, thus, the possibility to involve others in the learning process. Subsequently, e-portfolios are not only used to present final results but to include suggestions of other persons at a very early stage in the thinking process which ultimately initiate a process of critical reflection.

Take a written paper for example: Initial ideas are created online. Then other course participants (students, lecturers) are invited to directly comment on the ideas (and vice versa), in an organised peer-review-process. The outcome of this process is a final version which has been improved, changed and redeveloped from initial, online published ideas.
An essential part is the integration of external information sources. For instance, parts of thematically comparable papers or even individual discussion contributions taken from e-portfolios of other course participants.
The outcome of this kind of webbased co-operation is a network of linked pieces of information, so-called „hypertext", which has been created by several authors.

The possibility of putting information into context and to embed single pieces of information („micro content"), makes the e-portfolio a „dynamic learning room". Such dynamic learning rooms are better suited for meeting the requirements of learning in modern knowledge society than the static reproduction of knowledge could ever be able to.

However, a fundamental obstacle still needs to be overcome. This obstacle is the uncertainty of how long linked text objects, which have probably been created in co-operation with others, are available. At present, there is no accepted principle for authors to rely on when it comes to including online text objects in the personal e-portfolio.

In order to solve this problem, two aspects need to be taken into consideration: First, it is decisive that the institution which provides the e-portfolio develops a transparent strategy determining how content shall be handled in the future and, most importantly, how long it shall be available. Developing such a strategy is necessary in any case, regardless of the possibility to transfer content between systems and institutions. On one hand because owners of e-portfolios naturally have a strong need to use their personal learning space in the long term and on the other hand because regarding the generated hypertext structure all of its co-authors are affected, too. Since the topic of developing long term content strategies is already widely discussed, this article focuses rather on a different aspect which has not been discussed as extensively.

Even if institutions like universities can provide a solid framework, owners of e-portfolios still need to comply with certain rules when it comes to working with, most importantly, deleting previously published content.

Since, at present, authors don't have the possibility to signalize others how the available content can be used, an essential precondition for the formation and development of dynamic, long-term (even lifelong?) hypertext structures is missing. This problem is the origin for the following considerations:
The simplest way to solve the problem of reliable availability would be to leave online published information untouched and accessible under the same internet address forever. However, this is clearly hardly realisable due to economic reason. Who should provide the necessary financial means?

# 3. An approach: guarantee of existence

The approach suggested in this article gives authors the possibility to make reliable statements on the availability of published information. The e-portfolio software basically provides publishers with a kind of commitment option. This option is a guarantee given be the publisher that published information is not deleted until a certain period of time has expired. The metadata of a content object gives information on the author, the copyright owner, the publication date as well as how long the information will be available at the respective internet address which, essentially, needs to stay the same.

Two factors determine whether the concept will work properly: The assigned guarantee needs to be clearly visible. Moreover, the relation between the guarantee and the information needs to be obvious. In addition users need to show confidence in the guarantee. Crucial factors for confidence are the credibility of the organisation or institution responsible as well as a logical, transparent method according to which the guarantee of existence is set.

If credibility and method are accepted by the users, the precondition for „reliable availability of information", as mentioned above, is fulfilled. In combination with a precise linking mechanism, it becomes possible to include information reliably into a developing learning environment, which subsequently turns the e-portfolio into a sustainably usable knowledge ressource.

## 3.1. Method for the definition of a guarantee of existence

When it comes to developing a method for the definition of guarantees of existence, several questions need to be answered. First of all, it has to be decided who is able to set guarantees of existence.

The following three options seem reasonable:

1. The guarantee of existence is set by the author during the online publishing process.

2. Each piece of information of an e-portfolio is automatically provided with a pre-defined guarantee of existence. Either a period of time (eg. six month s after publication) or a fixed date (eg. Until 1.7.2008) can be pre-defined.

3. A person who is interested in the information determines how long the information should be available. He/she can either set a new guarantee of existence or extend the guarantee set by the author (or another reader). However, an author should not be deprived of the authority over his/her content. An author should still be able to refuse to set or extend a guarantee of existence.

## 3.2. Restrictions for definition of guarantees of existence

Restrictions for the definition of guarantees of existence are needed due to several, mainly economic, reasons. Different parameters are relevant:
• maximum duration for a guarantee of existence
• available memory capacity (disk space)

The process of deciding on the limits consists, for practical purposes, of two steps: First, the

system operators need to decide how long and to which extent e-portfolios can and should be available. Only afterwards, owners of e-portfolios can be provided with guaranteed ressources. Subsequently, owners can set or extend guarantees of existence within the given boundaries for content either published by themselves or by other authors (provided those allow others to set and extend guarantees of existence).

# 4. Impact of the guarantee of existence

## 4.1. Hypertext as a textformat for online information

We anticipate that students, who do not face unreliable availabilty, will no longer be reluctant to structure their E-Portofolio in an efficient hypertext format which is usually superior to the linear print format. A significant evidence for our assumption, could be a higher density of linkage of e-portfolios as opposed to today's average online-texts.

## 4.2. Effects on the handling of online information

It is only a matter of time that the possibility to set guarantees of existence will affect the learning in an online environment in more than one way. A major impact is, without any doubt, the necessity to develop a long term content strategy at the very beginning of an e-portfolio project. This is due to the fact that reliable availability of information goes hand in hand with considerable costs.

This reflection process is also triggered in the owners of the e-portfolios. Learners have to think about how they want to handle information created by themselves. At present, these questions are usually not discussed until its nearly too late. However, the possibility to determine guarantees of existence ensures that an agreement on how stored information should be handled has to be reached at the beginning of the usage of e-portfolios.

The learners, on the other side, need to decide whether their content should be deletable at all times or should be available for a certain period of time. This way, an author conveys how much he/she values online published information. He/she either states that he/she intends to handle information freely or that he/she gives a guarantee for its availabilty. What needs to be taken into consideration is whether it is an advantage to express the value of information via a guarantee of existence and whether the authority over information can or should be passed on to others. If an author allows others to extend the guarantee of existence for instance, he/she may give up on his/her authority over the information but, at the same time, clearly demonstrates his/her commitment to created content.

Owners of e-portfolios can certainly decline the option of the guarantee of existence. However, we reckon that information without guarantee of existence is more likely to be disregarded than information with guarantee of existence.

We concede that it is not possible to provide each piece of information with a guarantee of existence. This is due to the fact that owners of e-portfolios have to be provided with limited ressources by the decision-makers.

Readers greatly benefit from information with guarantee of existence. If a certain piece of information is reliably available until a certain point of time, there is no need to store the

information anywhere else. At present, the only possibility - and thus common practice - is to store important, online information on parallel media such as hard drives or webservers or even print it out. This is the only possibility to guarantee reliable availability and reliable reference of content, which should be included in the personal learning environment. Subsequently, information is stored several times together with all problems regarding disk space, security, copyright etc.

## 4.3. Context relation and linkage as quality indicators

A well-established and widely accepted indicator for the quality of scientific publications is the number of references to other publications in the field. This number describes to which extent the author has included related concepts in his work. A method like this, which has already proved itself in reality, could be used in an online environment such as the e-portfolio as well.

It is possible that the quality of texts published in the internet is increasingly measured by its degree of relation to other content. In other words: In a hypertext environment, texts are considered to be of high quality if they show few redundancies to other content in the informationpool but a high degree of context relation (linkage, interconnection).

In order to relate to other concepts, an informationpool containing concepts that have been agreed upon is needed. These concepts need to be available in a form suitable for hypertext. If it is easy to link an existing concept to others, students will handle tasks more efficiently.

## 4.4. Relevance and value of information

As mentioned above, the definition or extension of a guarantee of existence is also a statement on the relevance of the document. Generally speaking, a long guarantee of existence conveys a high value. (Although this estimation may not apply to every case, of course.)

One of the biggest problem of extensive information systems is the retrieval of relevant information. In other words: The wheat needs to be separated from the chaff. Ranking mechanisms (ranking algorithms) play an essential role. They determine in which order retrieved information is listed. The tremendous success of Google is be, among other things, owed to elaborate ranking mechanisms. Information is more relevant if a significant amount of websites, considered important, link to it. In this matter, the realization that the linkage of texts can be a relevant indicator for its importance was decisive.

The guarantee of existence could be accepted as an additional criteria and subsequently be taken into consideration by ranking mechanisms of either classical search engines or closed information systems.

## 4.5. Integration of text modules

Apart from hypertext structures, students still need to create linear texts. Let us return to our example of a written paper: Some information does not necessarily need to be newly composed but can be taken from the jointly created hypertext. Sometimes it is not enough to reference to further information. Instead, elements need to be included directly. However, it is not satisfactory to simply copy pieces of information as redundancies would be created. Hypertext visionaries like Ted Nelson expressed the desire to be able to include already existing text into one's own text. However, this requires that the included text, which was usually created by another author, is at least reliably available as long as one's own text is intended to be available. A guarantee of existence could create all necessary preconditions and thus realize the vision of the integration of texts of other authors.

## 4.6. Efficent deletion methods

E-portfolio systems which should work efficiently in the long term need to cover the complete content life cycle" In many cases, the phase of deleting content is considered either too late or too little.

An environment with guarantee of existence offers new perspectives for intelligent deleting methods. Unused information can easier be identified and deleted, linked information be held available. For instance, owners of e-portfolios can retrieve all information objects with expired guarantee of existence. A ranking which illustrates the degree of interconnection and thus the relevance (see above), allows users to delete unimportant content systematically. Based on this principle, automatic deleting mechanisms could be developed in the future.

# 5. References

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