BadgeRank and BadgeScore: Learning path modelling and recommending metrics based on OpenBadges

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Keywords: Openbadges, long life learning, learning path, value assessment, curriculum vitae, dependency ecosystems, taxonomies, graph metrics, e-portfolio

Objectives

This short paper is an insight into the network-based measurement of OpenBadges value approach named BadgeRank and BadgeScore. It seeks to stablish a conceptual foundation by defining its elements, proposing computational solutions and stating its main challenges.

This approach defines the two value indexes as following:

- BadgeRank is the intrinsic value of an OpenBadge, which reflects the absolute value, visibility and importance of it. It gets its value from the network of interconnected OpenBadges to which it belongs. The analogy is the PageRank of a single website.
- BadgeScore is an extrinsic value of an OpenBadge, which reflects the relative value, visibility and importance of it to a specific user's profile of education and learning life. It takes BadgeRank as the reference input and varies depending on the user's profile, evolution of its life-long learning and necessities. The analogy is the ranked-by-relevance results from a query on Google.

The objective is to research the possibilities of linking OpenBadges as a network to model diverse types of learning paths, and then design metrics to compute BadgeRank and BadgeScore.

Summary of results

Our first line of research into BadgeRank and Badgescore is the modeling of the network of OpenBadges and the conceptualization of computational algorithms.

A relevant mathematical model to study the topology of an educational or learning path is a Directed Acyclic Graph, where the vertices are OpenBadges and the edges are the pre-requisites of each OpenBadge. This plots a dependence ecosystem: the advancement in difficulty of a particular subject –its level- and the advancement path between subjects.

This approach is useful to measure some graph theory metrics such as out & in degree or betweenness centrality. Although these metrics have been used to analyze formal learning paths (a university degree path or even a group of degrees in the same university), the

problem arises when adding non-formal and informal learning into the paths or when combining OpenBadges issued from different institutions, because prerequisites between them get blurred or are inexistent and because description of each OpenBadge is not normalized.

Other useful factors to model edges between OpenBadges, particularly when the pre-requisites are not defined, are Badge Taxonomies. Based on previous research, this paper proposes a classification system based on the fields of knowledge, the competences and a set of categories that would allow the location of every OpenBadge in a concrete knowledge space. To do it, the OpenBadge metadata model has a tag field, but it's a non-controlled vocabulary system so it doesn't enforce normalization neither describes relationships between the different tags, posing a challenge to create a taxonomy or model it as a graph. There are some approaches to solve these problems, from enforcing a controlled vocabulary in the OpenBadges metadata model to the use of advanced techniques such as computational linguistics that can normalize terms and stablish hierarchy, associative and equivalence relationships.

Conclusions

This work in progress proposal aims to identify the requisites to design a synthetic ranking made of OpenBadges. Although the research on path modelling and metrics is still going on, we believe once a solution to link OpenBadges and compute metrics is found it will be possible to develop a prototype. This will measure OpenBadges' intrinsic values (BadgeRank) and help user decisions in the search of new learning opportunities or help employees search for candidates (BadgeScore).

771 palabras (min 500 / max 800)

Topics:

Recognition, assessment and accreditation of learning achievements and competencies
Continuing professional development and lifelong learning
Tools, platforms and infrastructures