Bestr: Open Badges for value recognition in Higher Education

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CINECA Interuniversity Consortium

**WHO**
- non-profit Consortium
  - 70 universities
  - 6 Research Institutions
  - Italian Ministry of Education (MIUR)
- 3 locations (HQ in Bologna), 750 employees, 100M€ annual budget
- Largest Computing Center in Italy (#12 worldwide)

**WHAT**
- HPC, Scientific visualization and interactive virtual environments
- Information systems for MIUR, Universities, for healthcare organizations
- Knowledge management, web portals, multimedia, e-learning
- Data center and Application Service Provider
- technological transfer activities for businesses and public administration, EU (>30 active projects)
Life WIDE Learning

The entire space of education (educational courses) and skills

INFORMAL

NON FORMAL

FORMAL

Certification of skills
Professional certifications
Proofs of the acquired skills

OPEN BADGES

Diplomas and Certificates

SCHOOL

UNIVERSITY

WORK

Life LONG Learning

Students, Professionals, Citizens
Bestr is a digital platform leveraging Open Badges to valorize Lifelong & Lifewide Learning

https://bestr.it
Bestr provides

- Digital Badging Platform + web portal, blog
- Curated Badges Publishing & Communication
  Editorial team for projects and badges definition, skills identifications and mapping (taxonomies), translations, visuals and graphics, ...
- Manual & Automatic Badge Issuing & sharing tools
- Federated Login and Issuing integration with Learning/Assessment Platforms
- End-user Helpdesk support
Bestr numbers

- 22 months old
- 76 organizations acting as Issuers, Endorsers, learning/assessment Providers
  - Universities, Companies, Associations, Certification bodies
- 38 projects
- 442 badge classes
- ~100 endorsed badge classes
- 16K assigned badges

https://bestr.it/badge/explore
Bestr community e dissemination
Open Badges?
A Badge is a **visual representation of acquired skills** or accomplished **achievements**.
Mozilla Open Badges

- A digital standard, innovative and secure, to verify and certify skills.
- Adopted all around the world by companies, university and education institutions.
- The tool to certify skills wherever traditional degrees can not
The Issuer defines competencies into a Badge.

The Badge class is published on Bestr.

Any organization might endorse the Badge class.

A learner claims a Badge by fitting its criteria and presenting evidences.

The Badge is issued to the learner. An issued Badge includes the learner's metadata and evidences.
Badges and Universities
Competencies in the University

**CURRICULAR**
- Course
- Lesson
- Lecture
- Lab
- ...

**EXTRA-CURRICULAR**
- Workshop
- Internship
- Hackathon
- Drama
- ...

Competencies
Open Badges can help Universities

- Give **real worth** to extra-curricular activities
- Give **value** to teaching projects in cooperation with other Universities
- Give **value** to e-learning materials produced by the University
- Give **visibility** to the competencies acquired by students through company internships
- Give **evidence** to cooperation with companies
- Give **importance** to collateral competencies developed by students during the course of their studies
- **internal staff development**
  - **Enhance** staff competencies
  - **Valorize** skills on career progress and internal job rotation

...many others
Learner

Issuer

Badge Value
(we know how to estimate it, but...)

Issuer Reputation + Badge Meaning + Endorsement + Badge Pathways
The problem

VALUE RECOGNITION
Open Recognition of lifelong and lifewide learning achievements

Open recognition for all

Open recognition technologies and infrastructure

Open recognition policies
How can we actually transfer the full value of our Badges to students?
How can we valorize competencies fostered by our extra-curricular activities?
How can we motivate students to attend extra-curricular activities?
How can I “monetize” my Badges?
Who will recognize my Badge?
“we call on the community of learning practitioners and technology developers to establish a trustworthy system of human and machine verifiable learning credentials and to adopt open standards facilitating the comparability and transferability of learning credentials.” (BORD 2016)

We digitize and automate the entire student life-cycle. Among others systems, we provide: Bestr, the Student Information System, e-Learning Platforms
The use case #1

The Eduopen Network &
The University of Milano-Bicocca
MOOCs and extra-curricular activities
Eduopen is an Italian University network offering free courses in e-learning format, adopting the model of Massive Open Online Courses (MOOCs). These courses are openly accessible to anyone who is interested. On completion of each course, the learner is assigned an Open Badge, detailing the activity pursued and competencies acquired.

15 Universities
92 Badges (and counting...)

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Eduopen needs

Automatic MOOC Badging based KPI

Mutual Badge recognition among Universities
Università di Milano Bicocca

- 5 Bestr Projects, 50 published Badges
  soft skills through formal and informal cultural studies
- number of MOOCs in Eduopen → Badges in Bestr
University of Milano–Bicocca needs

**Valorizing** competencies fostered by extra-curricular activities and MOOCs – and **motivating** students to attend them
The solution

Automatic course Badging using xAPI

+ Automatic credits recognition exploiting the Badge Endorsement
1- University A creates a Badge in Bestr

2- University B endorses the Badge on Bestr

3- The university SIS define rules for the Badge recognition as credits

4- A learner earns the Badge (xAPI) ...and Bestr presents it to the university (Bestr API)

5- The university approves the Badge and adds credits to the student’s record
A new MOOC starts in Eduopen

Data Mining - Classification

Part of the
Pathway in Introduction to Data Mining

About the Course

Learn how to formulate and solve classification problems for use in Data Mining and Business Intelligence applications such as fraud detection, customer churn, network intrusion detection, ... You will learn how to develop, validate and apply a data mining workflow to solve binary and non-binary classification problems. The course is self-contained, and it does not require any programming skills. Hands-on lectures are based on the KNIME open source software platform.
Open Badge design and publication
(Badge class)

A Bestr Badge is defined for each course published in EduOpen
Bestr Badge (Badge Class)

Data Mining: Classification

This Badge is earned by learners participating in the course "Data Mining: Classification" offered by EduOpen.
The Badge is to all intents and purposes the course's certificate of attendance.

Skills

The owner of this Badge participated in and successfully completed the course "Data Mining: Classification".
The owner of this BADGE has the following
Endorsement exploitation

A Badge endorsed by a University means both value recognition and automatic credit recognition by its Student Information System.
The Student Information System **shows all Badges** designed or endorsed by the University. Each Badge can be **mapped to the chosen number of credits** for a specific course of study.
Learners earn Badges (Award)

The Badge is awarded when the learner completes a course (xAPI).

If a learner earns a Badge designed or endorsed by the University, these awards are visible to the SIS.
We define an **Assessment Resource** for each Badge

- An Assessment Resource is a **condition** that has to be verified to issue the Badge to a user
- We express this condition in terms of **xAPI Activities**
eXperience API

- **xAPI** specification lets applications collect and share data about human performance and student learning experiences.
- Every learning «experience» is represented by a **statement** in form of a triple:
  - **Actor**, **Verb**, **Object**
  - and **Context** information are added too.
Mario completed Mathematics course on platform
Anna watched Economics video on Portal Y at 10:50
Giovanni published a blog post on Myblog
Maria participated at the conference on Renewable Energy
Giulia performed physics experiment with K simulator
Collecting xAPI Statements

- Bestr provides a **Learning Record Store – LRS**, a **standard registry** for xAPI Statements
- A Learner does activities inside **Eduopen** enrollments, course completion, new blog posts, watch a video, ...
- Eduopen **emits xAPI statements** stored in Bestr Learning Record Store

![Diagram](image-url)
Evaluating xAPI Statements

- Bestr monitors the LRS and checks the stored statements against the statements configured in Badges’ Assessment Resources
  - verb → completed
  - activity → Eduopen course specified as Assessment Resource of a Badge
Badge issuing

- If Badge award criteria are met:
  - Bestr sends the Badge to the user
  - Bestr writes a new “earned” statements inside the LRS
- Badge earned statement can be used as award criteria for other badges

LRS

Write xAPI statements

“user earned badge1”

.Aest

Award Badge

.B
Riconoscimento di crediti in base ai badge posseduti dallo studente

Endorsment

Institution
Integrating components

- SIS
- Bestr
- LMS/MOOC
- LRS

API

xAPI

xAPI?
Award page

ADA LOVELACE
got this Badge on July, 6th 2015

How do I get this Badge?

Bestr Friend

This Badge is awarded to those who see the innovative and groundbreaking potential of the Bestr project, and also to those who believe it is necessary to introduce Open Badges in Italy and in Europe as a way to valorize skills in a lifewide and lifelong learning context.
Vi presento il mio Badge! su @joinBestr! #openbadges #RSS2015 bestr.it/badge/show/3?l...
Credit recognition

Inside the Student Information System credits are recognized to students holding Badges – manually or automatically – according to the chosen rules.
Recognition vs credits

- A University can recognize Badges coming from other Universities or other organizations (endorsement) and transform them into formal credits for the students.

- But a Badge recognized by a University become part of the Diploma Supplement and transcript records in the Student Information System, even if it has no value in credits.
First steps towards an Extended Transcript!

Exams
Internships
Badges

Machine-readable transcript

References:
IMS Digital Credentialing initiative
The Evolution of the Transcript, Educause
The use case #2

University of Padova
Language proficiency Badges
How can we valorize skills fostered by our language courses?
How can we automatically recognize credits of our language courses?
English B1 - Reading and Listening

The Language Proficiency Badge - English B1 - Reading and Listening certifies the achievement of a level equivalent to B1 as indicated by the CEFR (Common European Framework of Reference), the European system that sets the general standards for language skills.
Use cases of credits recognition

- Badges for extra-curricular activities and soft skills
- Badges for language certifications
- Badges for computer science skills
The use case #3

From SIS to Badge
Degree → Badge
How can we valorize our degrees going beyond a personal declaration on a CV?
How can we make more visible competencies recorded inside Italian diplomas?
Diploma / foreign traineeship badges

Full Diploma skills recognition
University diplomas value recognition
University reputation
Formal → Badge
Evidence + Outcomes in xAPI

- **Standard completed xAPI statement**
- **Special defined context** with dedicated objects and URIs:
  - **Institution**
    - Additional information
  - **Activity (degree/traineeship) → Evidence**
    - Degree thesis title
    - Degree thesis abstract
  - **Result → Outcomes**
    - Degree date
    - Degree grade
    - Weighted average of exams
    - Percentile three years
    - Good standing

**Shared vocabulary**
Materiale prodotto per ottenere il Badge

Evidence + Outcomes
In the Badge award page

Degree thesis - Title
Systematics, taxonomy and phylogenetic relationships of the coral family Lobophylliidae

Degree thesis - Abstract
Traditional classification of scleractinian corals (Cnidaria, Anthozoa, Scleractinia) have been constructed on the basis of macromorphology. However, the commonly used skeletal characters are plagued by phenotypic plasticity and morphological convergence that fail to recognize most natural evolutionary lineages. Recent advances in molecular techniques have revolutionized the conventional taxonomic schemes, suggesting remarkably different phylogenetic relationships when compared with those based on macromorphology. In the last decade, the integration of this increasing amount of genetic data and new micromorphological and microstructural traits has led to a better understanding of evolutionary relationships between hard corals and opened the way to the new era of coral taxonomy.

The Indo-Pacific family Lobophylliidae potentially represents an interesting case study of "reciprocal illumination" between genetics and morphology. This taxon has been defined on a combination of phylogenetic analyses and micromorphological observations, although it still remains poorly understood. This dissertation aims to fill this gap in knowledge through the investigation of evolutionary relationships of the Lobophylliidae and starting the impending process of taxonomic revision of this family as a result of an integrated molecular and micromorphological approach.

Ulteriori informazioni sull'ottenimento del Badge

Le informazioni che seguono riguardano specificatamente il proprietario di questo Badge e sono diverse da learner a learner

Degree date: 2012-07-05
Degree grade: 110/100 con lode
Weighted average of exams (based on CFUs): 30
Percentile three years: 40

Percentile of the students who got the same or superior degree grade in the last three years in this Degree course or Degree course class

Titolo conseguito all'interno della durata del corso prevista: Yes
Informal → formal... and back again

- **Informal**
- **Non Formal**
- **Formal**

**Life WIDE Learning**
DLgs 13/2013

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Thank you!

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