The "Pollicina" Project: a Social Learning Management System in the Cultural Heritage Domain

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Abstract

The Pollicina project is aimed at defining a collaborative coordinated learning environment called Educational Social Network (EduSN) which allows to create knowledge itineraries in the cultural heritage domain (museums, churches, archaeological sites, etc.). The adopted approach is the flipped learning paradigm according to which the contents are proposed and articulated through interactive channels and the students elaborated them in a collaborative way. The goal of EduSN is to provide a learning environment where the social aspects (e.g. collaborating, networking and information sharing capabilities) become central for all the activities to improve the practices of learning. Students will be involved in problem solving activities: given a topic from the teacher, the students will be logically grouped for creating personalized itineraries in preparation to cultural heritage visits.

This paper presents the "Data Filling" service aimed at bringing the students closer to cultural heritage. This service is the first service of the Pollicina project. The students are organized within editorial committees, where each student reviews the work of peers. The proposed editorial process is supported by a novel workflow for managing the steps of the editorial process with a focus on the collaborative aspects. The interactions among peers are monitored by the teacher and the work is assessed by a team of cultural heritage experts one for each cultural institution belonging to the Pollicina project.

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1. Introduction

In the last decade, the learning paradigm is changed from the standard teacher-centered approach, in which the teacher almost solely performs a lesson in a classroom, to a student-centred approach where the student is engaged in the learning activities with peers playing an active role anywhere and anytime [4]. These features are typical of the Flipped Learning (FL) that goes beyond the concept of flipped classroom where the lectures are assimilated at home, and the classroom experience is devoted to the completion of the homework [3]. In the literature [2, 4], the goal is to define a social learning environment that integrates aspects of social networking, collaboration and knowledge sharing capabilities within the classic learning management system.

The "Pollicina" project [1] could be considered as part of the FL paradigm within the context of the "Art Education". The goal is to build a collaborative coordinated social learning environment which allows to create knowledge itineraries and to bring the students closer to cultural heritages (museums, churches, archaeological sites, etc.). To this aim, we are developing an Educational Social Network (EduSN) platform provided as a SaaS (Software as a Service). EduSN must provide an environment of "easy" access to the services provided, encouraging students to use it, and therefore it must adopt a language suited to the different age groups. In detail, EduSN addresses (according to the Italian academic institutions): LEVEL 1) primary school students (6-10 years), LEVEL 2) secondary school students of first-degree (11-13 years), and LEVEL 3) secondary school students of second-degree (14-19 years).

Students will be involved in problem solving activities: given a track from the teacher, the students will be logically grouped for creating personalized itineraries in preparation to cultural heritage visits. During the cultural heritage tours the experience is enhanced through applications accessible by mobile devices.

The starting phase of Pollicina (*http://www.progettopollicina.eu*) is to collect the heterogeneous material from the cultural heritage institutions that are joined to the project. The "Data Filling" service is the first service of EduSN, and it is aimed at managing the cultural heritage objects (cho_s) according to the FL paradigm: the students are organized in groups and thanks to their collaboration and cooperation are able to fill in ad hoc forms dedicated to the content of the cho_s.

2. The "Pollicina" Project

EduSN is a social suite of services dedicated to bringing students closer to the knowledge of cultural heritages.

2.1 Services

The editorial process is the common phase to all the services, where each student reviews the work of peers. The goal is to give responsibility and awareness to students; indeed, according to a typical collaborative learning approach, we proposed an innovative workflow made up of four phases: (1) "group creation", students are divided into groups by the teacher and for each of them is attributed a temporary role (leader or peer review), (2) "learning activity," students act on the assigned activity ranging from the filling in of a cultural form to the definition of personalized cultural itineraries made available by the system, (3) "assessment", students valid the work performed by the peers, (4) "the approval decision", the teacher judges the work of the students on the basis of several parameters not only cognitive, but also related on the organizational, social, and collaboration aspects. In EduSN the definition of an itinerary is inserted within a virtual social collaborative space, which allows students to share materials, ideas, activities, and past itineraries. In this respect, the common social technologies are adopted such as chat, and social wall with the addition of a social feedback mechanism dedicated to the peer assessment.

The most important services are:

- The "Data Filling": this service is dedicated to the management of the cho_s. The staff of Pollicina is digitalizing all the material shared by the cultural heritage institutions. In addition, thanks to the support of our cultural expert the content is opportunely modified and enriched. Once concluded this phase, the students can access to the assigned cultural form dedicated to a specific cho, and then filling in the content after a deep study (see Section 2.2 for more details).
- Personalized Itineraries: this service is dedicated to the definition of the customized itineraries by two modalities: ArtTour and Game, respectively. In the ArtTour service a cultural path is defined thanks to the collaboration of the students. Given a topic by the teacher, the editorial

committee proposes an itinerary after several phases (each of one follows the workflow previously introduced): selection/filter of the cho_s, storytelling of the cho_s selected, and definition of the related cultural path according to the belongness to specific cultural heritage institutions by the use of maps indoor for the definition of logistic paths. In the Game service, several games can be chosen (e.g., puzzle, quiz, conceptual map) with the intent to teach amusing: when the students will find themselves in front of a game, the development of the game itself will help them to learn memorizing notions related to the knowledge of a specific cho. In this case, the cultural path is given by the aggregation of several games, and the correct development of a game will allow to create it gradually.

- Storytelling: each cultural heritage could be enriched with information provided by external knowledge sources (e.g., web pages, providers collected from the Europeana project, Wikipedia pages, etc.) for the definition of the related storytelling. The goal is to enrich and investigate the topics assigned by the teacher associating each cho with digital material such as images, video, music, etc. Each group of students is responsible in identifying the suited digital material and acquires greater cognitive awareness and increases self-esteem [6].

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Once defined the itineraries, the students can perform their visit to the indoor cultural heritage via a dedicated App. By this App will be possible to realize an augmented visit: the students can obtain more information thanks to the use of the beacon technology, and QR codes.

2.1 The "Data Filling" Service

The "Data Filling" service is the first one of the EduSN platform, and it is aimed at defining the knowledge of cho_s that will be stored in the repository. Once the material has been stored, then it can be used for the definition of the personalized itineraries, for the storytelling, etc. This means that the work performed at this stage is propaedeutic for all the EduSN's learning activities, and it requires several phases as shown in Figure 1. In detail:

- Phase 1: the cultural heritage institutions selected the most significant cho_s to be included in the Pollicina project. The Staff of the project digitalized the material according to a specific set of attributes derived by formal schemas adopted by the museums. In detail, we have analysed the guidelines of the SIERBeC (*http://www.lombardiabeniculturali.it/sirbec/*) structure where more than 20 forms are defined one for each type of cho. Given the heterogeneity (e.g., paintings, archaeological finds, statues, etc.) of the material provided and for the necessity of the project, we have defined a unique schema for representing and synthetizing the information of the cho_s by analysing the whole SIERBeC forms. In addition, we have added new attributes related to, for example, the GPS coordinates of the cultural site, description of the indoor/outdoor location, tags for describing the content of cho_s, storytelling, curiosity, etc.

- Phase 2: thanks to the support of our expert in Art and Teaching we have modified and elaborated the cho_s' descriptions properly. Indeed, the knowledge of cho_s must be accessible to all ages of the students involved allowing them to have textual descriptions according to their level of education.

- Phase 3: the schema defined during "Phase 2" is used to digitalize the cho_s. According to the scholastic institutions, we have filled in several attributes in order to help and support the students during the completion of the other attributes. At the end, for each school, we have assigned the schemas precompiled. At this stage, the schools involved are the ones of LEVEL 3 (see Section "Introduction").
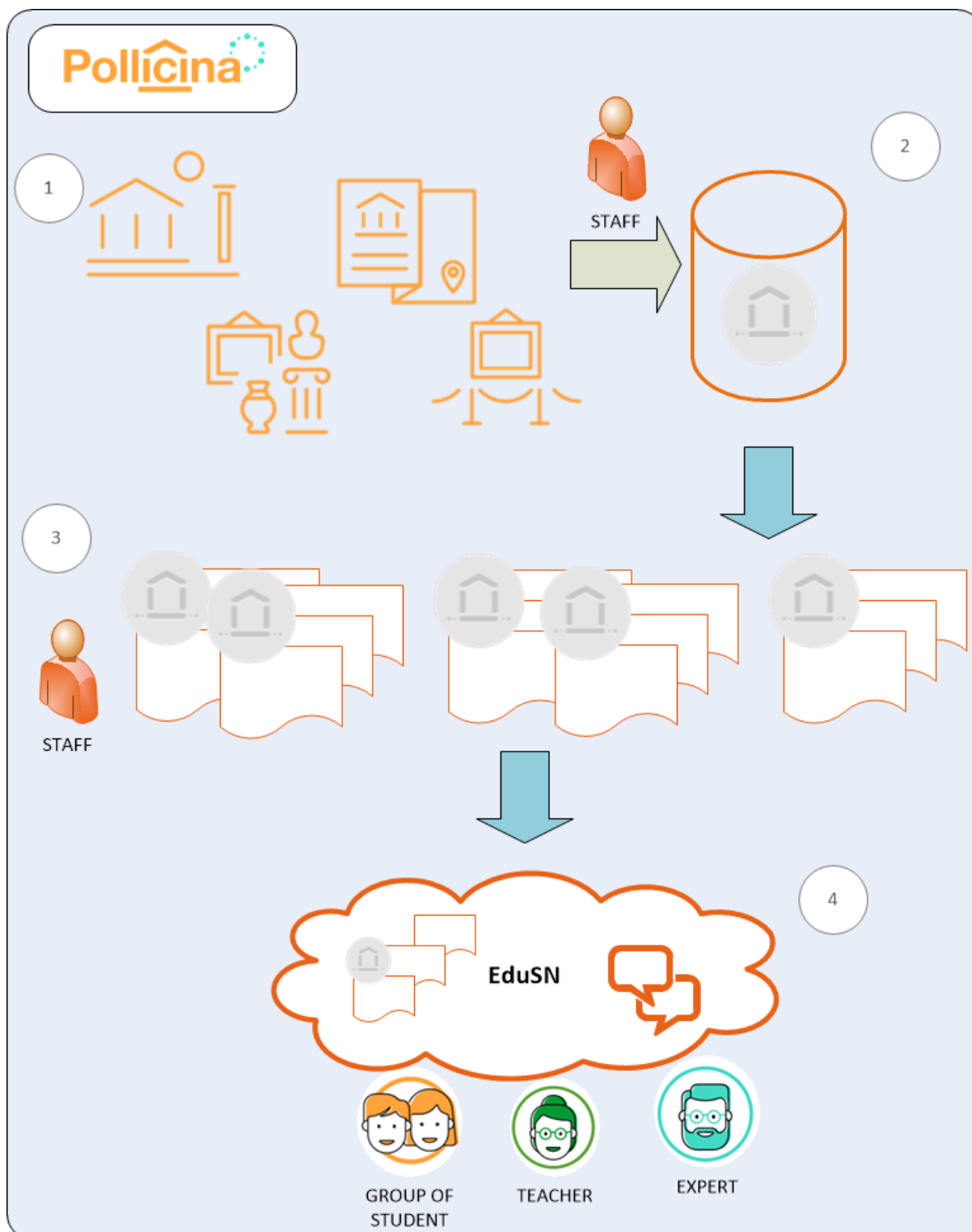
Fig. 1 - The scheme of the "Data Filling" service

- Phase 4: the actors can access to EduSN for completing the assigned schemas. We have defined a workflow to manage the editorial process as previously described. Let us remember that the interactions among peers are monitored by the teacher and the work is assessed by a team of cultural heritage experts one for each cultural institution belonging to the Pollicina project. At this phase, there is not a student leader as in the next EduSN's services, here the students can share comments to improve the content of attributes until

the teacher will send the schema to the expert. An expert can approve either the completed schema, and then to certify the quality of the work, or can refuse the work adding any comments. At this phase, a student learns how to looking for information by several sources of knowledge, for example, by using search engine in order to complete the "Curiosity" and "Description" attributes for the three levels of education, summarize the textual information by the reference website and by the given text within the cho_s' form. The site visits will also include scenarios for users who are visually impaired; the paths and applications will be equipped with the technologies enabling vocal tools supporting audio-guide related to the knowledge of cho_s prepared in these phases.

3. Conclusions

The "Pollicina" project is aimed at defining a collaborative social suite called EduSN that follows the principles of the FL paradigm. The goal is to obtain an active participation in the cultural life; the younger users will approach the historical and cultural issues through direct involvement in pleasurable activities sharing comments, experiences, and ideas. Several services will be developed aimed at defining the itineraries; the first one is the "Data Filling" service dedicated to the completion of the schemas relating to the material provided by the cultural heritage institutions. Even in this initial phase, students work on editorial committees, having both the role of editor and reviewer, learning to confront each other and with teachers, according to simple rules of engagement. They become the producers of knowledge, with peer help, under the guidance of teachers and experts of cultural institutions, in a form of social learning for art.

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