Disciplina: Requirements Specification

TeachMePlease, https://teachmeplease.com

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1 Introduction

1.1 Purpose

The purpose of this document is to provide a set of formal requirements for the Disciplina platform.

1.2 Platform description

Disciplina platform is intended to act like a backend for other educational services. These services include CRM/ERP platforms of educational institutions (e.g., Blackboard, Moodle), online services (e.g., TeachMePlease, Coursera, Khan Academy) and others. The primary goal of the Disciplina platform is to unite all of these diverse sources of educational records and store them in an untamberable ledger. The place of the Disciplina platform in the educational ecosystem is shown in Figure 1
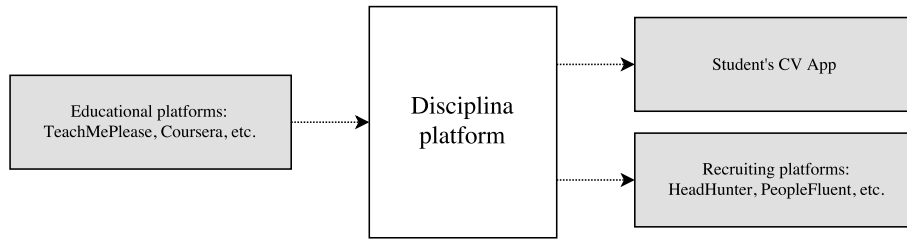

Figure 1: The scope of the Disciplina platform. The arrows denote data flow

The records that appear during the educational process have value: the data can be interesting to the recruiters, psychologists, data analysts, etc. Thus, Disciplina has a second role: a data market, where the interested parties pay for the access to the data, and the parties, whose data is being disclosed, receive those payments.

1.3 Definitions

Throughout this document we use the following terms:

Term	Definition
Student	Any person that acquires knowledge
Educator	Any entity that provides knowledge. It can be an educational institution, a private teacher and even an employer
Teacher	Either a private teacher or a teacher that is employed in an educational institution
Subject	An area of knowledge
Course	A particular educational program in a certain subject
Course Modification (CM)	A Course associated with particular Teachers, Students and timeline

Term	Definition
User	Any entity that make use of the platform features
Token	Intrinsic currency of the platform

2 Platform features

This section is organized according to platform features. Each feature has a brief description and a set of functional, security and performance requirements that should be fulfilled.

2.1 Cryptocurrency

The platform users should have an ability to pay for educational services using the intrinsic cryptocurrency.

2.1.1 Functional requirements

FR1 Each User should have a (possibly zero) balance of Tokens

FR2 Users should have an ability to make payments in Tokens

FR3 The platform should store payment history in a public ledger

2.1.2 Security requirements

SR1 The public ledger should be readable by anyone

SR2 The platform should allow only valid transactions to occur

SR3 Past transactions should be protected from modification

2.1.3 Peformance requirements

PR1 Payments should take no longer than [5 minutes] to confirm

2.2 Journal of academic achievements

During the education process Educators generate records to the journal of academic achievements. These records should be private and append-only: the records should be protected from modifications and data leakage.

2.2.1 Functional requirements

FR4 An Educator should be able to register a Student for the Course Modification

FR5 The Educator should be able to assess the students during the CM timeline

FR6 The Educator should be able to append the assessments to the journal

FR7 The Educator should be able to read the data from the journal

FR8 The Student should be able to prove that the Educator assessed him with a certain grade

FR9 The Student should be able to get a CV with proofs of all the grades he received during the education

2.2.2 Security requirements

SR4 The journal should be protected from data leakage

SR5 Past journal entries should be protected from modification

2.3 Data disclosure

The platform should provide data disclosure capabilities: the Educators should be able to trade the private data for the intrinsic cryptocurrency. The parties, interested in the data, should be able to make filter requests to the entire platform, the relevant Educators should be chosen automatically.

2.3.1 Functional requirements

FR10 Every interested party should be able to make a data disclosure request with a predicate specifying a set of students

FR11 The request should be forwarded to all Educators that have records on the relevant students

FR12 Upon receiving a request, the Educator should be able to trade the data for the platform Tokens

FR13 Part of the Tokens payed by the buyer should be transferred to the balances of all the students, whose educational records have been disclosed

2.3.2 Security requirements

SR6 The data should be disclosed only if the Educator receives the payment

SR7 The payment should be made only if the interested party receives the data

SR8 The platform should provide mechanisms against the creation of secondary market

SR9 The platform should provide mechanisms against the creation of fake Students

SR10 The platform should provide mechanisms against the creation of fake educational institutions

2.4 Ratings

Some entities in the platform should be rated. Currently, the knowledge people get in educational institutions is valued more than the one got from private tutors and online educational platforms. The rating system should make it possible for private tutors and online platforms to gain substantial reputation and prove the knowledge they provide is no worse than people get by enrolling in a large educational institution. Eventually, the platform should achieve one of its major goals: to unite the ways people get knowledge.

2.4.1 Functional requirements

FR14 Each Teacher should have rating

FR15 Each educational institution should have rating

FR16 Each Course should have rating

FR17 Each Student should have rating

FR18 The algorithms of rating computation should be replaceable: in case the initial rating computation algorithm fails to provide adequate ratings for the participants, the developers should be able to modify the algorithm

FR19 Ratings should provide equal opportunities for educational institutions and private teachers

FR20 Students should be able to assess the Courses they completed

FR21 The rating system should treat older assessments as less important than newer ones

2.4.2 Security requirements

SR11 The rating system should be resistant to collusion

SR12 The rating system should be resistant to Sybil attacks

SR13 The rating system should be decentralized: no central authority should have mechanisms to tamper with the ratings

2.5 Interoperability

The primary educational service that would use Disciplina is TeachMePlease platform. However, forcing educational institutions to use TeachMePlease as their CRM/ERP platform is unjustified. Thus, one should be able to use Disciplina with other educational platforms like Blackboard, Moodle and others.

2.5.1 Functional requirements

FR22 The platform should be interoperable with TeachMePlease

FR23 The platform should be interoperable with Blackboard

FR24 The platform should be interoperable with Moodle

FR25 The platform should provide an interface for integration with other educational platforms

Uncategorized: - Entry exams, graduation exams, etc. - Private key recovery - Time delta ratings to resolve recursion - Arbitrage (if the score wass not right) - Old data are less valued - Make incentives not to use other teacher's account