

Διπλωματική εργασία

Σχεδιασμός και υλοποίηση συνεργατικού ιστοχώρου ερευνητών

Σαμαράς Δημήτριος

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Συστημάτων

<https://arch.ece.uowm.gr/mdasyg>

Ιούλιος 2022



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ
ΠΟΛΥΤΕΧΝΙΚΗ ΣΧΟΛΗ
ΤΜΗΜΑ ΗΛΕΚΤΡΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ
& ΜΗΧΑΝΙΚΩΝ ΥΠΟΛΟΓΙΣΤΩΝ

Δομή παρουσίασης

- Εισαγωγή
- Παρόμοια συστήματα
- Θεωρητικό υπόβαθρο
- Σχεδιασμός και ανάπτυξη
 - Απαιτήσεις συστήματος
 - Βάση δεδομένων
 - Ασφάλεια συστήματος
- Λειτουργίες και διεπαφή χρήστη
- Μετρικές συστήματος
- Συμπεράσματα
- Μελλοντικές επεκτάσεις

Εισαγωγή

Συνθήκες που ενέπνευσαν την δημιουργία του συστήματος

- Απαίτηση εγκατάστασης επιπλέον λογισμικού
- Πρόσβαση από όλους τους σύγχρονους φυλλομετρητές
- Δυνατότητα δωρεάν εγγραφής στο σύστημα
- Παροχή δωρεάν υπηρεσιών προς όλους τους χρήστες της πλατφόρμας
- Ευκολία στην χρήση των λειτουργιών της πλατφόρμας και στην πλοήγηση της

Παρόμοια συστήματα

Στο διαδίκτυο υπάρχουν διάφορες πλατφόρμες συνεργατικής συγγραφής κώδικα LaTeX, ωστόσο καμία από αυτές δεν είναι δωρεάν.

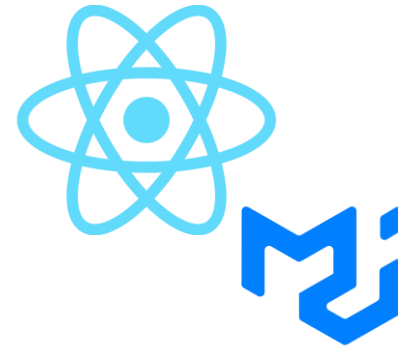


COCALC

PVPEERIA

Θεωρητικό υπόβαθρο

Front-end



L^AT_EX

Back-end



Σχεδιασμός & ανάπτυξη (1/3)

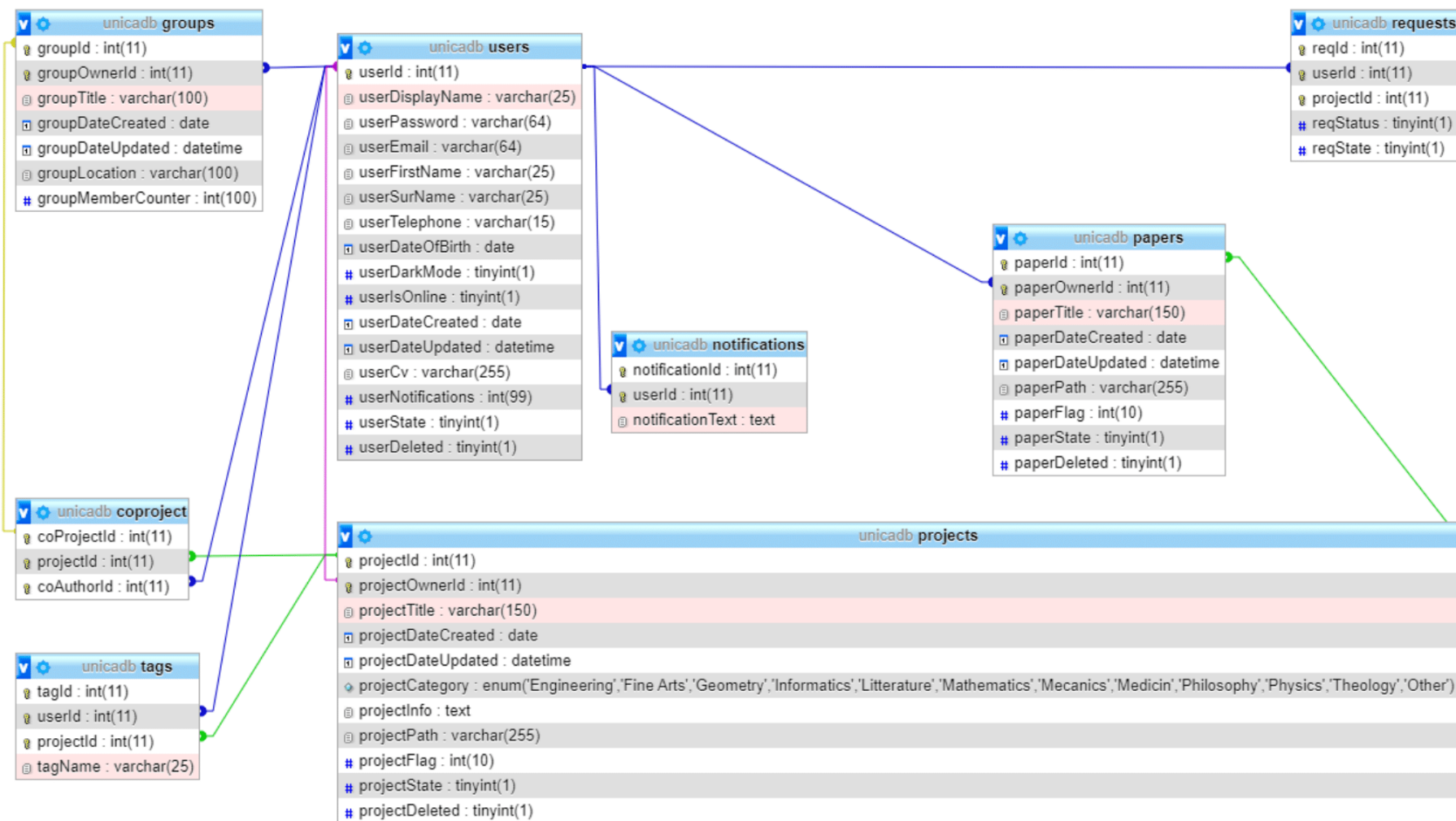
Απαιτήσεις συστήματος

- Κατηγορίες χρηστών (επισκέπτες, εγγεγραμμένοι χρήστες)
 - Επισκέπτες & εγγεγραμμένοι χρήστες
 - Εγγραφή και σύνδεση στο σύστημα
 - Προβολή δημόσιων έργων
 - Εγγεγραμμένοι χρήστες
 - Δημιουργία έργων (project)
 - Προβολή προσωπικών έργων
 - Επεξεργασία, μεταγλώττιση και αποθήκευση κώδικα έργου
 - Λήψη αρχείων
 - Επεξεργασία πληροφοριών χρήστη
- Εφαρμογή ασφάλειας σε κάθε πτυχή του συστήματος
- Φιλικό περιβάλλον χρήσης (UI friendly)

Σχεδιασμός & ανάπτυξη (2/3)

Βάση δεδομένων

Διάγραμμα UML βάσης δεδομένων από το περιβάλλον PhpMyAdmin



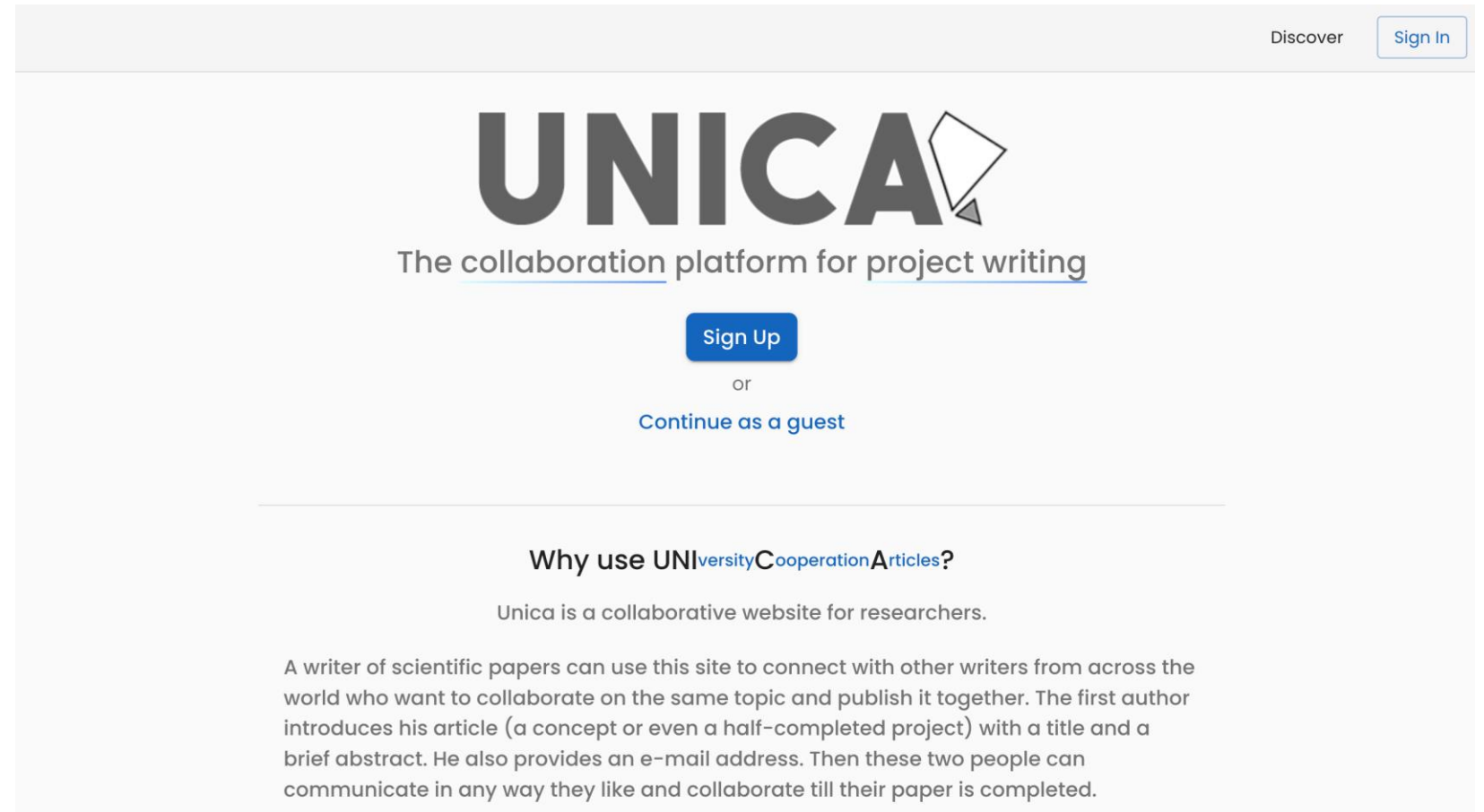
Σχεδιασμός & ανάπτυξη (3/3)

Ασφάλεια συστήματος

- Λειτουργία συνόδου (session) με την χρήση κλειδιού ασφαλείας (token)
- Προστασία από επιθέσεις ψεκασμού εντολών SQL (SQL Injection)
- Προστατευμένα τερματικά (api endpoints) με την χρήση token
- Επικύρωση (validation) εισαγωγής και αποστολής δεδομένων
- Ενσωμάτωση και χρήση του npm (Node Package Manager)

Λειτουργίες & διεπαφή χρήστη (1/10)

Σελίδα προορισμού



Discover [Sign In](#)

UNICA

The collaboration platform for project writing

[Sign Up](#)

or

[Continue as a guest](#)

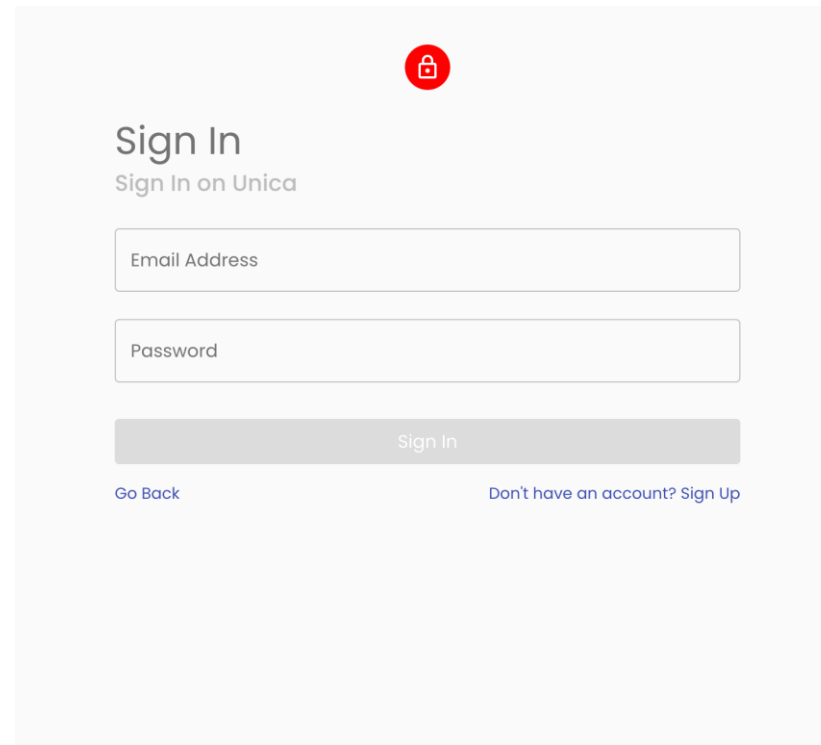
Why use UNiversityCooperationArticles?

Unica is a collaborative website for researchers.

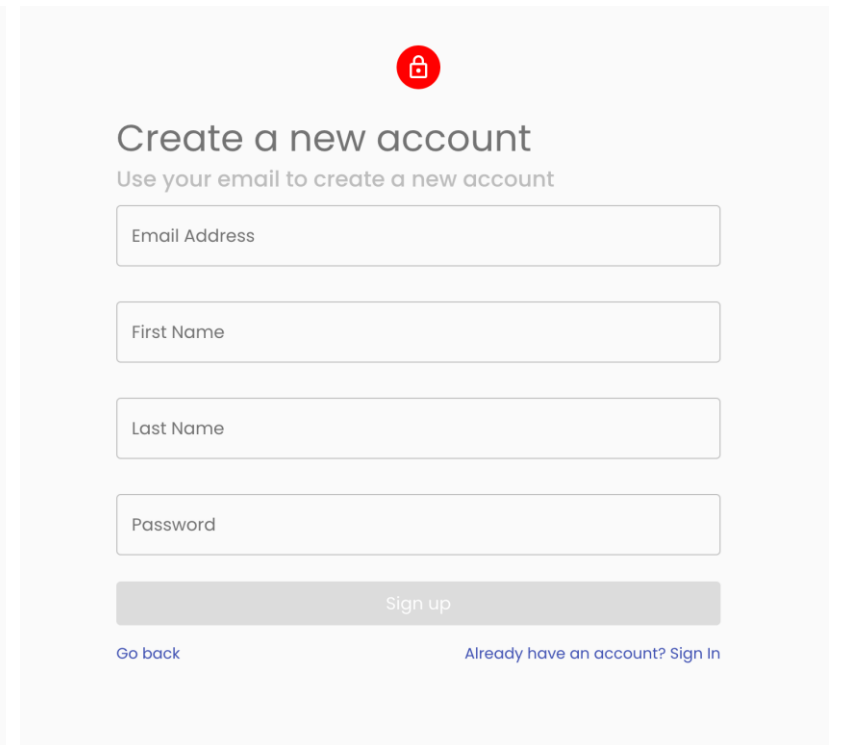
A writer of scientific papers can use this site to connect with other writers from across the world who want to collaborate on the same topic and publish it together. The first author introduces his article (a concept or even a half-completed project) with a title and a brief abstract. He also provides an e-mail address. Then these two people can communicate in any way they like and collaborate till their paper is completed.

Λειτουργίες & διεπαφή χρήστη (2/10)

Σύνδεση και Εγγραφή χρήστη (sign in & sign up) (1/2)



The Sign In form features a red lock icon at the top center. Below it, the title "Sign In" is displayed in a large font, followed by the subtitle "Sign In on Unica" in a smaller font. The form contains two input fields: "Email Address" and "Password". A grey "Sign In" button is positioned below the fields. At the bottom, there are two links: "Go Back" on the left and "Don't have an account? Sign Up" on the right.



The Create a new account form features a red lock icon at the top center. Below it, the title "Create a new account" is displayed in a large font, followed by the subtitle "Use your email to create a new account" in a smaller font. The form contains four input fields: "Email Address", "First Name", "Last Name", and "Password". A grey "Sign up" button is positioned below the fields. At the bottom, there are two links: "Go back" on the left and "Already have an account? Sign In" on the right.

Λειτουργίες & διεπαφή χρήστη (2/10)

Σύνδεση και Εγγραφή χρήστη (sign in & sign up) (2/2)

localhost:3000 says
User not found. Please try again!

OK

Sign In


Sign In on Unica

Email Address
samaras@test.com

Password

Sign In

[Go Back](#) [Don't have an account? Sign Up](#)



Create a new account

Use your email to create a new account

Email Address
Email is required

First Name
First name is required

Last Name
Last name is required

Password
Password is required

Sign up

[Go back](#) [Already have an account? Sign In](#)

Λειτουργίες & διεπαφή χρήστη (3/10)

Σελίδα ανακάλυψης έργων (Discover)

Discover

Available for collaboration projects
Here, you will find a list of the available projects to collaborate with other users.

| Projects | | | Search |
|--------------------------|-------------|-------------------|------------------------|
| Name | Category | Owner | Email |
| > Article Template | Philosophy | Dimitrios Samaras | samarasdelta@gmail.com |
| > Book Template | Litterature | Dimitrios Samaras | samarasdelta@gmail.com |
| > Formal Letter Template | Other | Dimitrios Samaras | samarasdelta@gmail.com |
| > Greek Template | Other | Dimitrios Samaras | samarasdelta@gmail.com |
| > Math Template | Mathematics | Dimitrios Samaras | samarasdelta@gmail.com |

5 rows |< < 1-5 of 5 > >|

Λειτουργίες & διεπαφή χρήστη (4/10)

Σελίδα προβολής και διαχείρισης έργων (Dashboard)

The dashboard interface features a blue header with the title "Dashboard" and navigation icons. A left sidebar contains "Discover", "Dashboard", and "Deleted" options. A "+ Create" button is positioned at the top left of the main content area. The main area displays five template cards, each with the following information:

- Article Template**: Category: Philosophy, Public: On, Last Modified: 08/05/2022 - 23:10
- Book Template**: Category: Litterature, Public: On, Last Modified: 08/05/2022 - 23:08
- Formal Letter Template**: Category: Other, Public: On, Last Modified: 08/05/2022 - 23:08
- Greek Template**: Category: Other, Public: On, Last Modified: 08/05/2022 - 23:07
- Math Template**: Category: Mathematics, Public: On, Last Modified: 08/05/2022 - 23:05

Each card includes an "Edit" button and a trash icon for deletion.

Λειτουργίες & διεπαφή χρήστη (5/10)

Δημιουργία έργων (Create)

Create new project

Please fill in a title and a category for your project. Additionally, there is an option to enter a code template to get started. Finally, you can choose whether your project will be public or not.

Title*

Template

Category*

Public

Cancel Create

Create new project

Please fill in a title and a category for your project. Additionally, there is an option to enter a code template to get started. Finally, you can choose whether your project will be public or not.

Title*

Template

Category*

Public

Cancel Create

Λειτουργίες & διεπαφή χρήστη (6/10)

Επεξεργασία πληροφοριών έργου (Edit)

Edit project

Here, you can edit your project preferences, such as it's title, the category or it's public state.

Title *

Category *

Public

Cancel [Submit](#)

Λειτουργίες & διεπαφή χρήστη (7/10)

Σελίδα προβολής και διαχείρισης διαγραμμένων έργων (Deleted)

Deleted

You can see a list of your deleted projects (if any) here and decide whether you want to completely delete them or recover them so you can work on them again.

letter 1

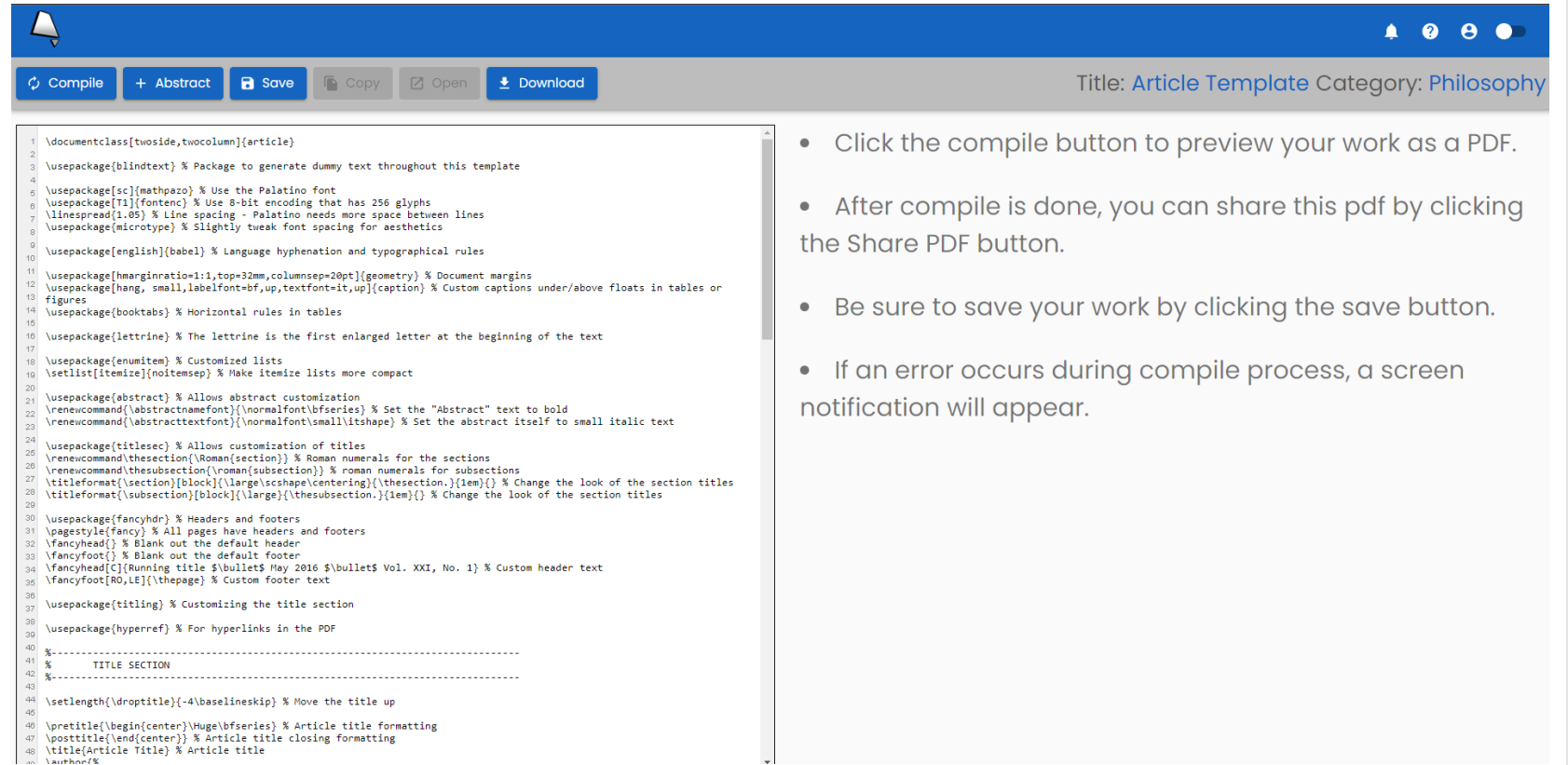
Category: Philosophy

Public: On

Last Modified: 09/05/2022 - 18:05 [Restore](#)

Λειτουργίες & διεπαφή χρήστη (8/10)

Σελίδα συγγραφής και μεταγλώττισης έργου (1/2)



The screenshot shows a LaTeX editor interface. At the top, there is a toolbar with buttons for 'Compile', '+ Abstract', 'Save', 'Copy', 'Open', and 'Download'. To the right of the toolbar, the text 'Title: Article Template Category: Philosophy' is displayed. Below the toolbar is a code editor showing LaTeX source code. The code includes various package loading and configuration commands for a two-column article template. The code is as follows:

```
1 \documentclass[twoside,twocolumn]{article}
2
3 \usepackage{blindtext} % Package to generate dummy text throughout this template
4
5 \usepackage[sc]{mathpazo} % Use the Palatino font
6 \usepackage[T1]{fontenc} % Use 8-bit encoding that has 256 glyphs
7 \linespread{1.05} % Line spacing - Palatino needs more space between lines
8 \usepackage{microtype} % Slightly tweak font spacing for aesthetics
9
10 \usepackage[english]{babel} % Language hyphenation and typographical rules
11
12 \usepackage[hmarginratio=1:1,top=32mm,columnsep=20pt]{geometry} % Document margins
13 \usepackage[hang, small,labelfont=bf,up,textfont=it,up]{caption} % Custom captions under/above floats in tables or figures
14 \usepackage{booktabs} % Horizontal rules in tables
15
16 \usepackage{lettrine} % The lettrine is the first enlarged letter at the beginning of the text
17
18 \usepackage{enumitem} % Customized lists
19 \setlist[itemize]{noitemsep} % Make itemize lists more compact
20
21 \usepackage{abstract} % Allows abstract customization
22 \renewcommand{\abstractnamefont}{\normalfont\bfseries} % Set the "Abstract" text to bold
23 \renewcommand{\abstracttextfont}{\normalfont\small\itshape} % Set the abstract itself to small italic text
24
25 \usepackage{titlesec} % Allows customization of titles
26 \renewcommand{\thesection}{\Roman{section}} % Roman numerals for the sections
27 \renewcommand{\thesubsection}{\roman{subsection}} % roman numerals for subsections
28 \titleformat{\section}[block][\large\scshape\centering]{\thesection.}{1em}{} % Change the look of the section titles
29 \titleformat{\subsection}[block][\large]{\thesubsection.}{1em}{} % Change the look of the section titles
30
31 \usepackage{fancyhdr} % Headers and footers
32 \pagestyle{fancy} % All pages have headers and footers
33 \fancyhead{} % Blank out the default header
34 \fancyfoot{} % Blank out the default footer
35 \fancyhead[C]{Running title $\bullet$ May 2016 $\bullet$ Vol. XXI, No. 1} % Custom header text
36 \fancyfoot[RO,LE]{\thepage} % Custom footer text
37
38 \usepackage{titling} % Customizing the title section
39
40 \usepackage{hyperref} % For hyperlinks in the PDF
41
42 %-----
43 % TITLE SECTION
44 %-----
45
46 \setlength{\droptitle}{-4\baselineskip} % Move the title up
47
48 \pretitle{\begin{center}}\huge\bfseries % Article title formatting
49 \posttitle{\end{center}} % Article title closing formatting
50 \title{Article Title} % Article title
51 \author{} % Author
```

- Click the compile button to preview your work as a PDF.
- After compile is done, you can share this pdf by clicking the Share PDF button.
- Be sure to save your work by clicking the save button.
- If an error occurs during compile process, a screen notification will appear.

Σελίδα συγγραφής και μεταγλώττισης έργου (2/2)

Λειτουργίες & διεπαφή χρήστη (8/10)

The screenshot displays a LaTeX editor interface. The top bar includes navigation icons and a title bar: "Title: Article Template Category: Philosophy". Below the bar are buttons for "Compile", "Abstract", "Save", "Copy", "Open", and "Download".

The left pane shows the LaTeX source code for an article template, including package loading, font settings, margins, and title formatting. The right pane shows the compiled PDF document. The PDF has a title "Article Title", author "JOHN SMITH", affiliation "University of California", email "john@smith.com", and date "July 10, 2022". It includes an abstract section with placeholder text and a table of contents with sections "I. INTRODUCTION" and "II. METHODS".

```
1 \documentclass[twoside,twocolumn]{article}
2
3 \usepackage{blindtext} % Package to generate dummy text throughout this template
4
5 \usepackage{sc}[mathpazo] % Use the Palatino font
6 \usepackage[T1]{fontenc} % Use 8-bit encoding that has 256 glyphs
7 \linespread{1.05} % Line spacing - Palatino needs more space between lines
8 \usepackage{microtype} % Slightly tweak font spacing for aesthetics
9
10 \usepackage[english]{babel} % Language hyphenation and typographical rules
11 \usepackage[hmarginratio=1:1,top=32mm,columnsep=20pt]{geometry} % Document margins
12 \usepackage[hang, small,labelfont=bf,up,textfont=it,up]{caption} % Custom captions under/above floats in tables or
13 figures
14 \usepackage{booktabs} % Horizontal rules in tables
15
16 \usepackage{lettrine} % The lettrine is the first enlarged letter at the beginning of the text
17
18 \usepackage{enumitem} % Customized lists
19 \setlist[itemize]{noitemsep} % Make itemize lists more compact
20
21 \usepackage{abstract} % Allows abstract customization
22 \renewcommand{\abstractnamefont}{\normalfont\bfseries} % Set the "Abstract" text to bold
23 \renewcommand{\abstracttextfont}{\normalfont\small\itshape} % Set the abstract itself to small italic text
24
25 \usepackage{titlesec} % Allows customization of titles
26 \renewcommand{\thesection}{\Roman{section}} % Roman numerals for the sections
27 \renewcommand{\thesubsection}{\roman{subsection}} % roman numerals for subsections
28 \titleformat{\section}[block]{\Large\scshape\centering}{\thesection.}{1em}{} % Change the look of the section titles
29 \titleformat{\subsection}[block]{\Large}{\thesubsection.}{1em}{} % Change the look of the section titles
30
31 \usepackage{fancyhdr} % Headers and footers
32 \pagestyle{fancy} % All pages have headers and footers
33 \fancyhead{} % Blank out the default header
34 \fancyfoot{} % Blank out the default footer
35 \fancyhead[C]{Running title $\bullet$ May 2016 $\bullet$ Vol. XXI, No. 1} % Custom header text
36 \fancyfoot[RO,LE]{\thepage} % Custom footer text
37
38 \usepackage{titling} % Customizing the title section
39
40 \usepackage{hyperref} % For hyperlinks in the PDF
41
42 % -----
43 % TITLE SECTION
44 % -----
45
46 \setlength{\droptitle}{-4\baselineskip} % Move the title up
47
48 \pretitle{\begin{center}}\huge\bfseries % Article title formatting
49 \posttitle{\end{center}} % Article title closing formatting
50 \title{Article Title} % Article title
51 \author{}
```

Λειτουργίες & διεπαφή χρήστη (9/10)

Σελίδα ρυθμίσεων χρήστη

The image shows a user settings page with a blue header bar containing a hamburger menu icon, the text 'Settings', and notification, help, and refresh icons. A left sidebar contains a search icon, a window icon, and a trash icon. The main content area is divided into two sections: 'Personal info' and 'Password'. The 'Personal info' section has the subtitle 'The information can be edited' and three input fields: 'First name' with the value 'Dimitrios', 'Last name' with the value 'Samaras', and 'Email address' with the value 'samarasdelta@gmail.com'. A 'Save details' button is at the bottom right of this section. The 'Password' section has the subtitle 'Update password' and two input fields: 'New password' with the placeholder 'Please specify your new password' and 'Confirm password' with the placeholder 'Please re-enter your new password'. An 'Update' button is at the bottom right of this section.

Settings

Personal info
The information can be edited

First name
Dimitrios

Last name
Samaras

Email address
samarasdelta@gmail.com

Save details

Password
Update password

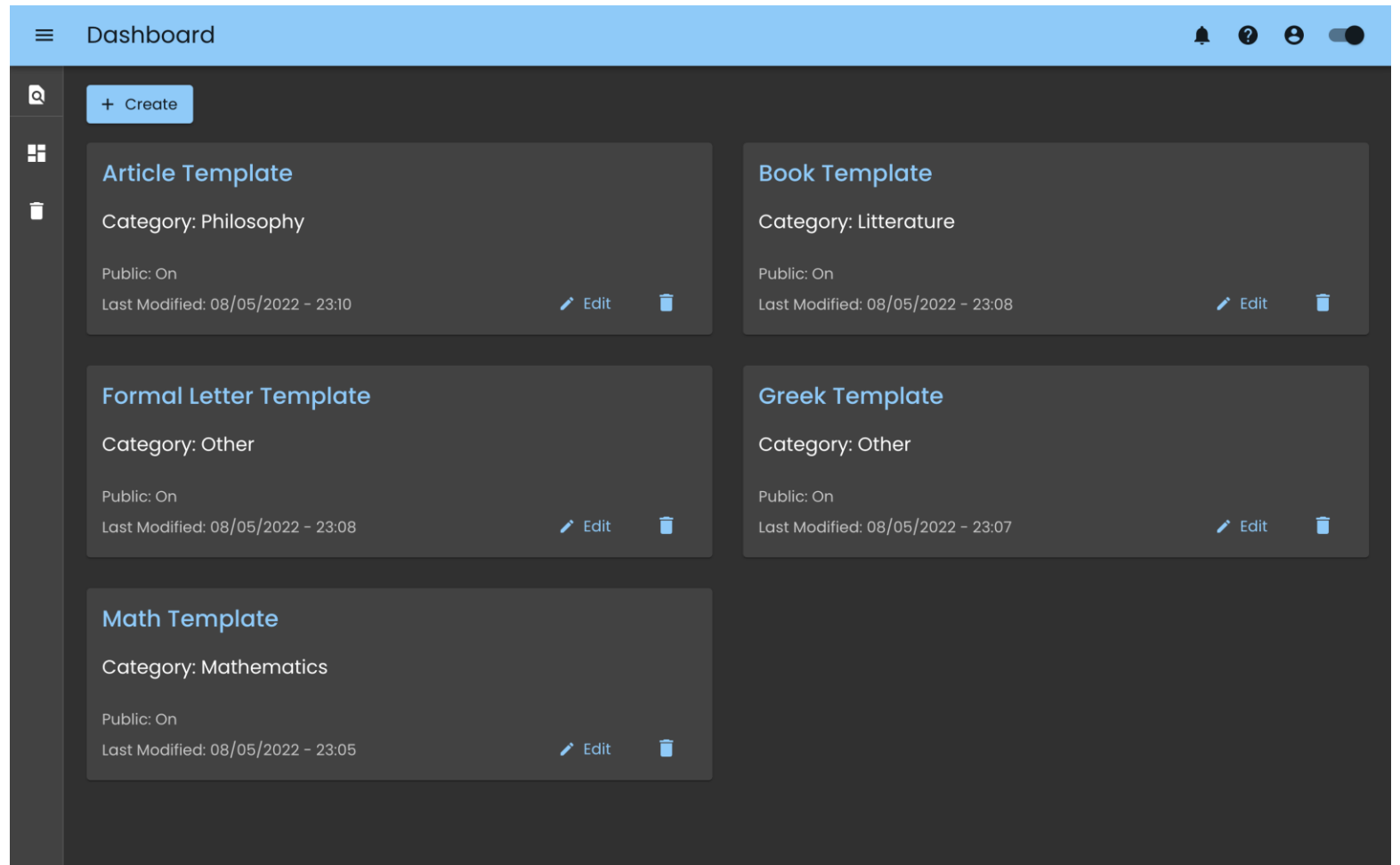
New password
Please specify your new password

Confirm password
Please re-enter your new password

Update

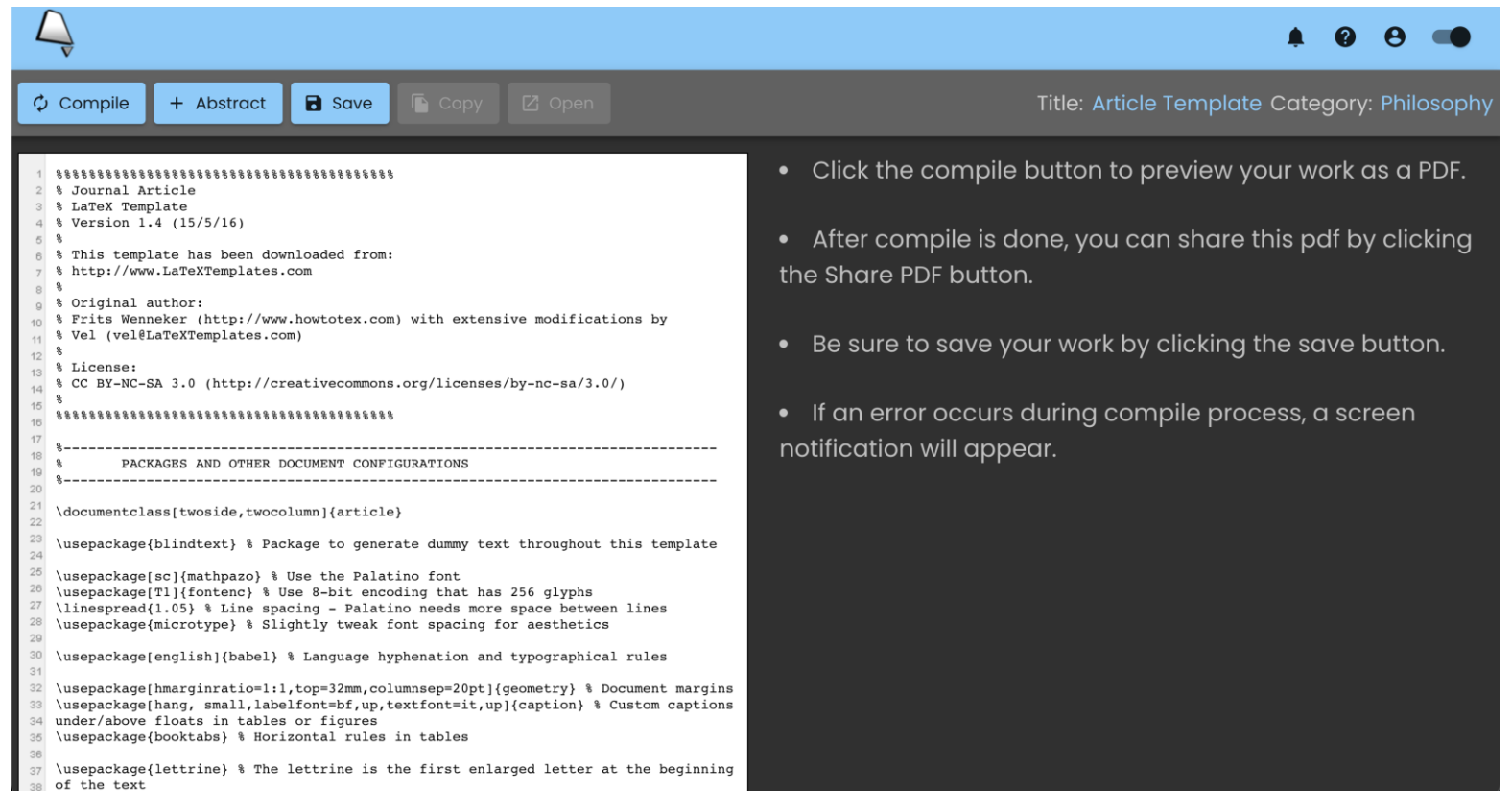
Λειτουργίες & διεπαφή χρήστη (10/10)

Εναλλαγή θεμάτων εμφάνισης (light mode / dark mode) (1/2)



Λειτουργίες & διεπαφή χρήστη (10/10)

Εναλλαγή θεμάτων εμφάνισης (light mode / dark mode) (2/2)



The screenshot shows a web-based LaTeX editor interface. At the top, there is a navigation bar with buttons for 'Compile', '+ Abstract', 'Save', 'Copy', and 'Open'. The title bar indicates 'Title: Article Template Category: Philosophy'. The main area is a code editor displaying LaTeX source code. To the right of the code editor, there is a list of instructions for using the editor.

```
1 % Journal Article
2 % LaTeX Template
3 % Version 1.4 (15/5/16)
4 %
5 % This template has been downloaded from:
6 % http://www.LaTeXTemplates.com
7 %
8 % Original author:
9 % Frits Wenneker (http://www.howtotex.com) with extensive modifications by
10 % Vel (vel@LaTeXTemplates.com)
11 %
12 % License:
13 % CC BY-NC-SA 3.0 (http://creativecommons.org/licenses/by-nc-sa/3.0/)
14 %
15 %
16 % -----
17 % PACKAGES AND OTHER DOCUMENT CONFIGURATIONS
18 % -----
19
20
21 \documentclass[twoside,twocolumn]{article}
22
23 \usepackage{blindtext} % Package to generate dummy text throughout this template
24
25 \usepackage[sc]{mathpazo} % Use the Palatino font
26 \usepackage[T1]{fontenc} % Use 8-bit encoding that has 256 glyphs
27 \linespread{1.05} % Line spacing - Palatino needs more space between lines
28 \usepackage{microtype} % Slightly tweak font spacing for aesthetics
29
30 \usepackage[english]{babel} % Language hyphenation and typographical rules
31
32 \usepackage[hmarginratio=1:1,top=32mm,columnsep=20pt]{geometry} % Document margins
33 \usepackage[hang, small,labelfont=bf,up,textfont=it,up]{caption} % Custom captions
34 under/above floats in tables or figures
35 \usepackage{booktabs} % Horizontal rules in tables
36
37 \usepackage{lettrine} % The lettrine is the first enlarged letter at the beginning
38 of the text
```

- Click the compile button to preview your work as a PDF.
- After compile is done, you can share this pdf by clicking the Share PDF button.
- Be sure to save your work by clicking the save button.
- If an error occurs during compile process, a screen notification will appear.

Μετρικές συστήματος

Μετρικές κώδικα Front-end

| Γλώσσα | Αρχεία | Γραμμές κώδικα |
|------------|--------|----------------|
| JavaScript | 78 | 5810 |
| CSS | 6 | 187 |
| JSON | 2 | 40 |
| Markdown | 1 | 37 |
| HTML | 2 | 17 |
| Σύνολο | 89 | 6091 |

Μετρικές κώδικα Back-end

| Γλώσσα | Αρχεία | Γραμμές κώδικα |
|--------------------|--------|----------------|
| JavaScript | 12 | 569 |
| TeX | 5 | 287 |
| Bourne Again Shell | 1 | 100 |
| Σύνολο | 18 | 956 |

Συμπεράσματα

- Σύγχρονο και ασφαλές
- Επεκτάσιμο και συντηρήσιμο
- Δεν απαιτείται εγκατάσταση τρίτου λογισμικού
- Υποστηρίζεται από όλους τους σύγχρονους browsers
- Δυνατότητα δωρεάν εγγραφής και χρήσης του συστήματος
- Ευκολία στη χρήση

Μελλοντικές επεκτάσεις

- Δυνατότητα υποστήριξης φωτογραφιών
- Προσθήκη ζωντανής συνομιλίας (chat)
- Δημιουργία προφίλ χρηστών

Επίδειξη

Ακολουθεί επίδειξη της λειτουργίας του συστήματος

<https://unica-ruby.vercel.app>

UNICA!

Τέλος
παρουσίασης

Ευχαριστώ πολύ για την προσοχή σας!

Ερωτήσεις;