Using Open Source Software and SCRUM methodology in SE course at Faculty of Mathematics in Belgrade

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Outline

- Course ‘Software Development 2’
- SCRUM
- Open Source Software
- Ongoing Projects
  - Qlab
  - FocusOPEN
- Conclusion

Software Development 2

- Elective course held at the Faculty of Mathematics, study program Informatics, during the first year of Master studies.
- Software development 2 is structured in such way that course central activity is focused on projects.
- Classes: 2+3+2
- ECTS: 9

Software Development 2

- Project (in this case, open source projects) must be realized using Agile methodology SCRUM
- Teams should be cross-functional
- All SCRUM roles should be covered by members of project team
- All SRUM product deliverables should be produced

Open Source Software

Open Source software is available in source code form: the source code and other rights normally reserved for copyright holders are provided under a software license that permits users to study, change, improve and at times also to distribute the software.

Main types of software product firms:

- Closed source firms.
- Single-vendor open source firms.
- Open source distributors.

Open Source Software

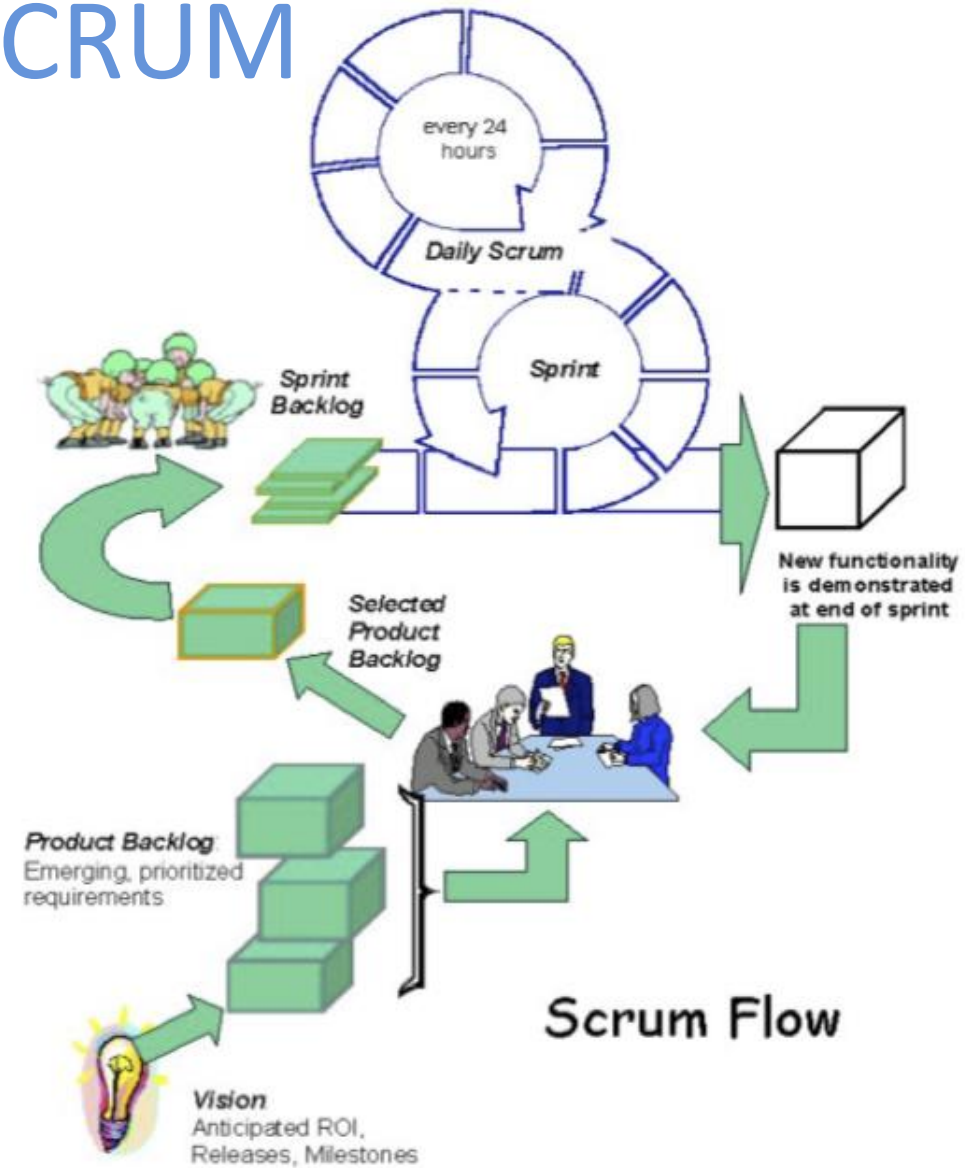
1. Free Redistribution
2. Source Code
3. Derived Works
4. Integrity of the Author's Source Code
5. No Discrimination Against Persons or Groups
6. No Discrimination Against Fields of Endeavor
7. Distribution of License
8. License Must Not Be Specific to a Product
9. License Must Not Contaminate Other Software

Open Source Software

- Examples of Open Source software:
  - Alfresco
  - Circa BC
  - Open Office
  - My SQL
  - Linux
- Microsoft and Open Source
- Universities and Open Source

SCRUM

Iterative, incremental framework for project management often seen in agile software development.



Timeboxes, Roles, Rules

SCRUM

- SCRUM, grounded in empirical process control theory, employs an iterative, incremental approach to optimize predictability and control risk.
- Three pillars:
  - Transparency
  - Inpection
  - Adaptation

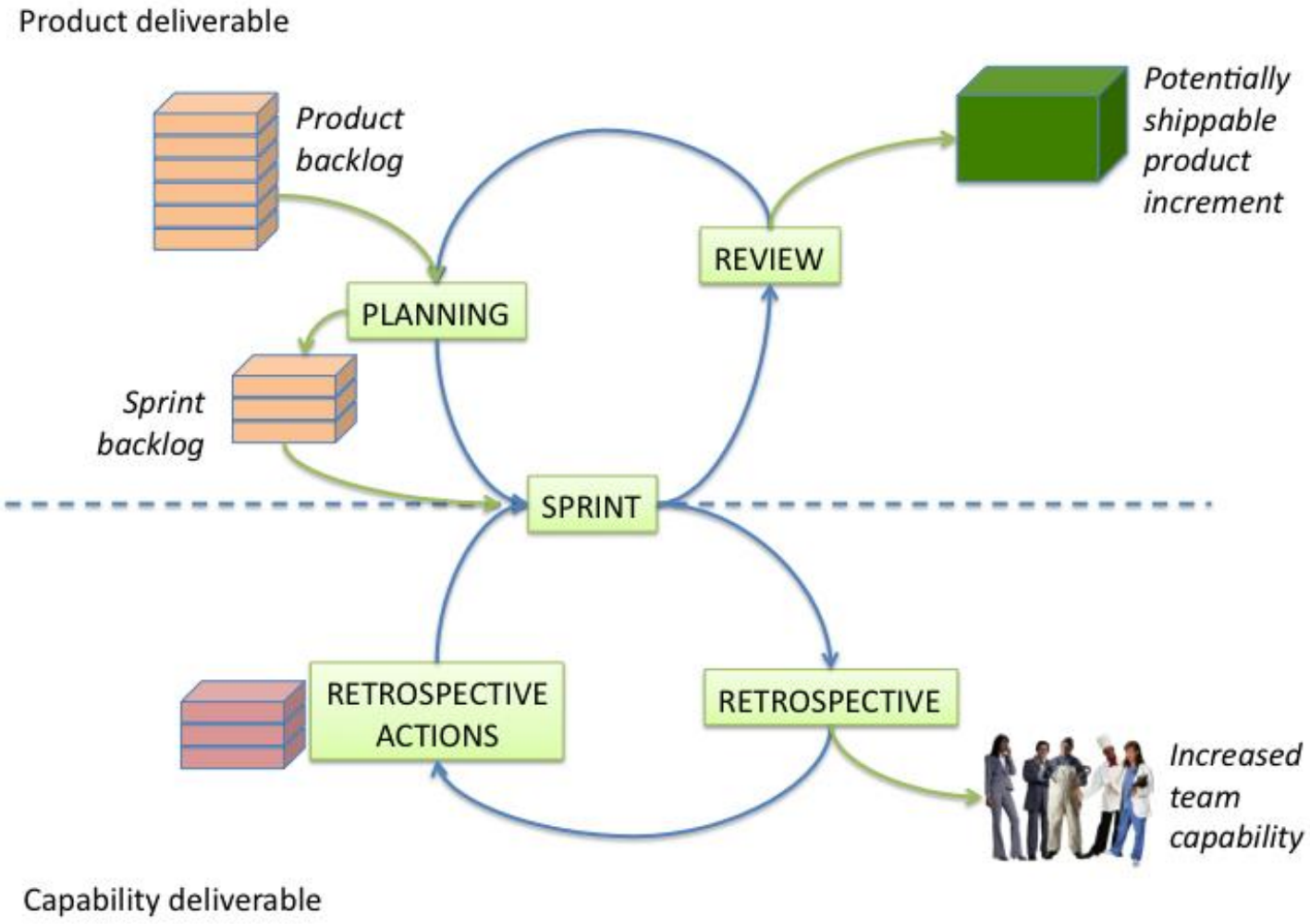
SCRUM

- Teams (and associated roles: chicken and pigs)
  - Scrum master, product owner, team
  - Optimal size of team 7 ± 2
- Time-Boxes
  - Elements of SCRUM that are time-boxed are Release Planning Meeting, Sprint Planning Meeting, Sprint, Daily Scrum, Sprint Review, and the Sprint Retrospective.
- Artifacts
  - Product Backlog, Sprint Backlog, Release Burndown, Sprint Burndown

SCRUM

- Rules bind together Scrum's time-boxes, roles, and artifacts.
  - For example, it is a Scrum rule that only Team members - the people committed to turning the Product Backlog into an increment – can talk during a Daily Scrum.
  - When rules are not stated, the users are expected to figure out what to do. Don't try to figure out a perfect solution, because the problem usually changes quickly.

SCRUM


Product deliverable
Product backlog
Potentially shippable product increment
REVIEW
PLANNING
Sprint backlog
SPRINT
RETROSPECTIVE ACTIONS
RETROSPECTIVE
Increased team capability
Capability deliverable

Ongoing projects

- Open source projects that students work on have different sizes, different levels of maturity, different motivation and different initiators.
- Projects in this year:
  - Qlab
  - FocusOpen
  - EA solver service and its application
  - Testing platform for market strategies
  - Plagiarism detecting service
  - Automatic organizer for scientific papers

Qlab

- Open Source alternative for Matlab
  - Features
  - Industry
  - Faculties of mathematics
  - Technical faculties
  - Price
- Project lasts for 3+ years, more than 30 students involved, 8 from this SE course
- Using potentials
  - Informatics
  - Mathematics

Qlab

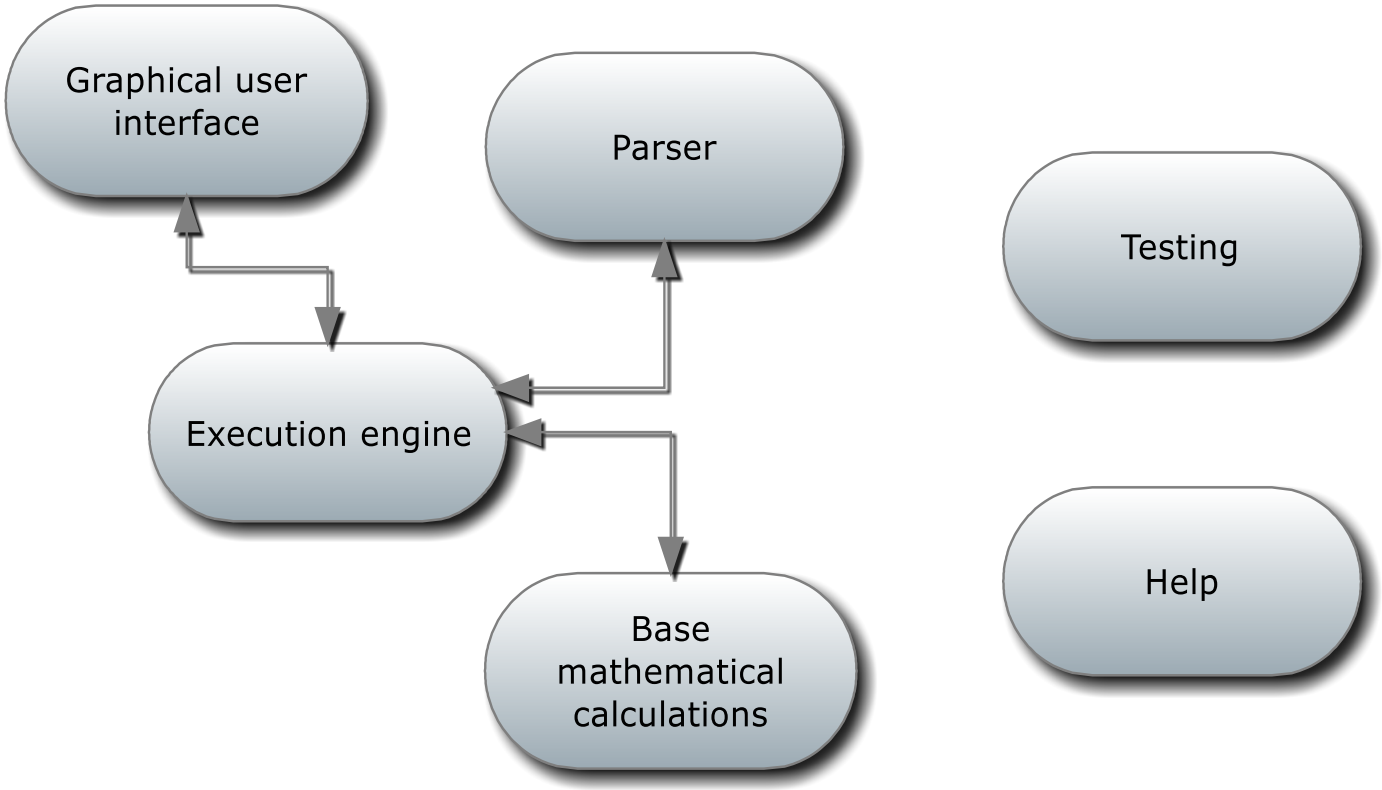
- Supporting organizations
  - Faculty of Mathematics
  - Microsoft Serbia
- Qlab for students
  - .NET learning
  - Practice
  - References
  - Flexibility

Qlab - Technology

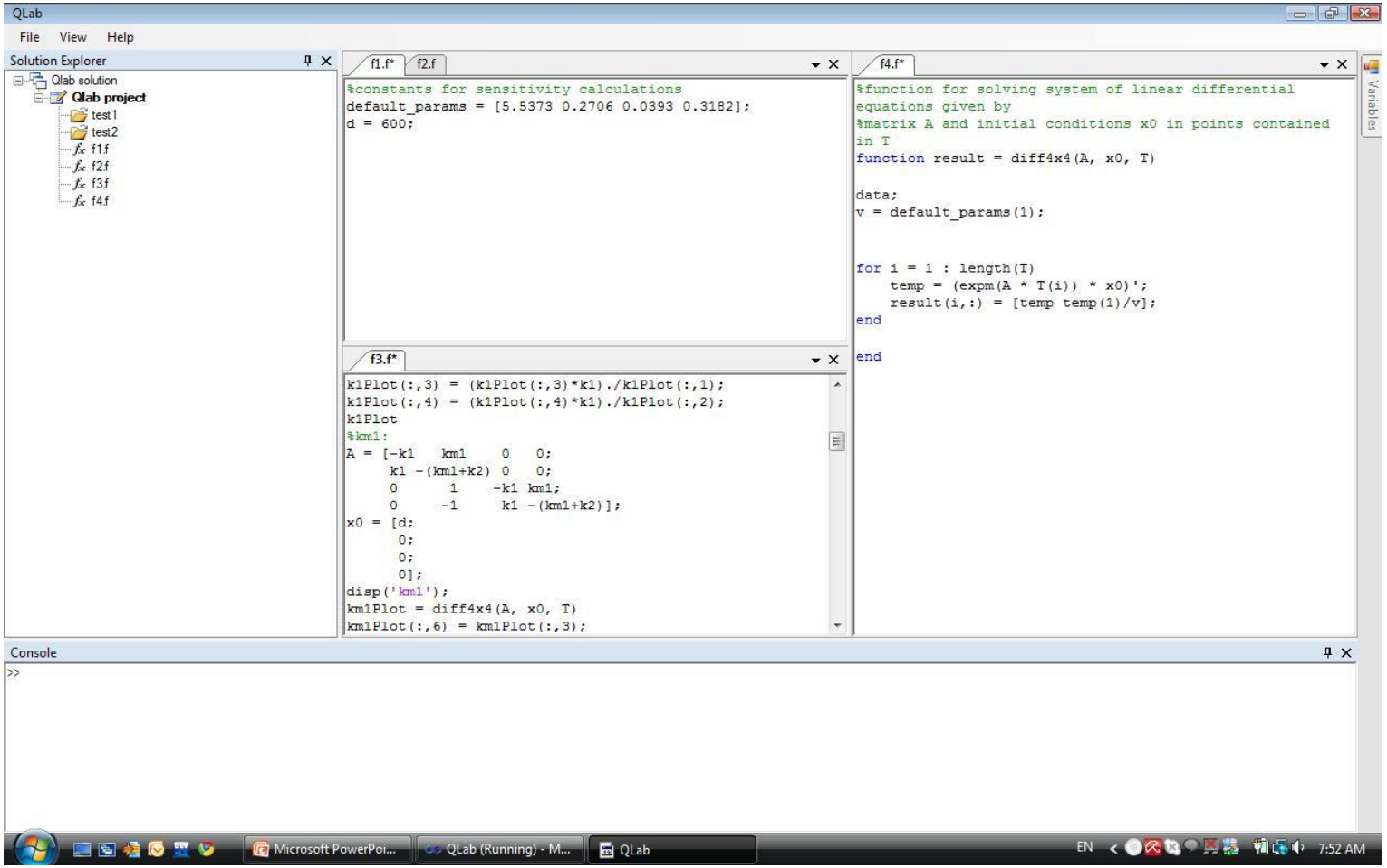
- .NET Framework 4.0
- C#
- WPF
- Open Source community
  - Gardens Point Parser (Queensland University of Technology)
  - Avalondock Panels (Adolfo Marinucci)
  - both released under “free-BSD”

Qlab - Realization

Subprojects



Qlab - Screenshot



FocusOPEN

- Digital asset management (DAM) consists of management tasks and decisions surrounding the ingestion, annotation, cataloguing, storage, retrieval and distribution of digital assets
- Generally the "asset" being managed is collected and stored in a digital format
- DAM software may be open source or proprietary

FocusOPEN

- FocusOPEN Digital Asset Manager is a digital asset management solution designed to help businesses make more of their media, from managing brands to distributing marketing collateral or other media assets.
- FocusOPEN Digital Asset Manager is Open Source software, created by Daydream Interactive Limited.

FocusOPEN

- FocusOPEN have following characteristics:
  1. Ability to upload and store digital resources
  2. Ability to add various properties to uploaded digital resource
  3. Ability to work on the web
  4. Advanced Search
  5. Powerful Media Processing Features
  6. Easy To Use
  7. Flexible and Configurable
  8. Scalable

FocusOPEN

- FocusOPEN have following characteristics:
  9. Possibility of automatic interchange
  10. Ability for further changes and improvements
  11. Multiple brands under multiple domains in the same core system
  12. Single sign-on
  13. Streamlined Cataloguing
  14. Copyright and Brand Control
  15. Comprehensive Statistics and Reporting

FocusOPEN - Technology

- FocusOPEN is based on Windows server technology. The main requirements are:
  - Windows Server 2003 or 2008
  - IIS 6,7 or 7.5
  - SQL Server 2005 or 2008
  - ASP.NET 3.5

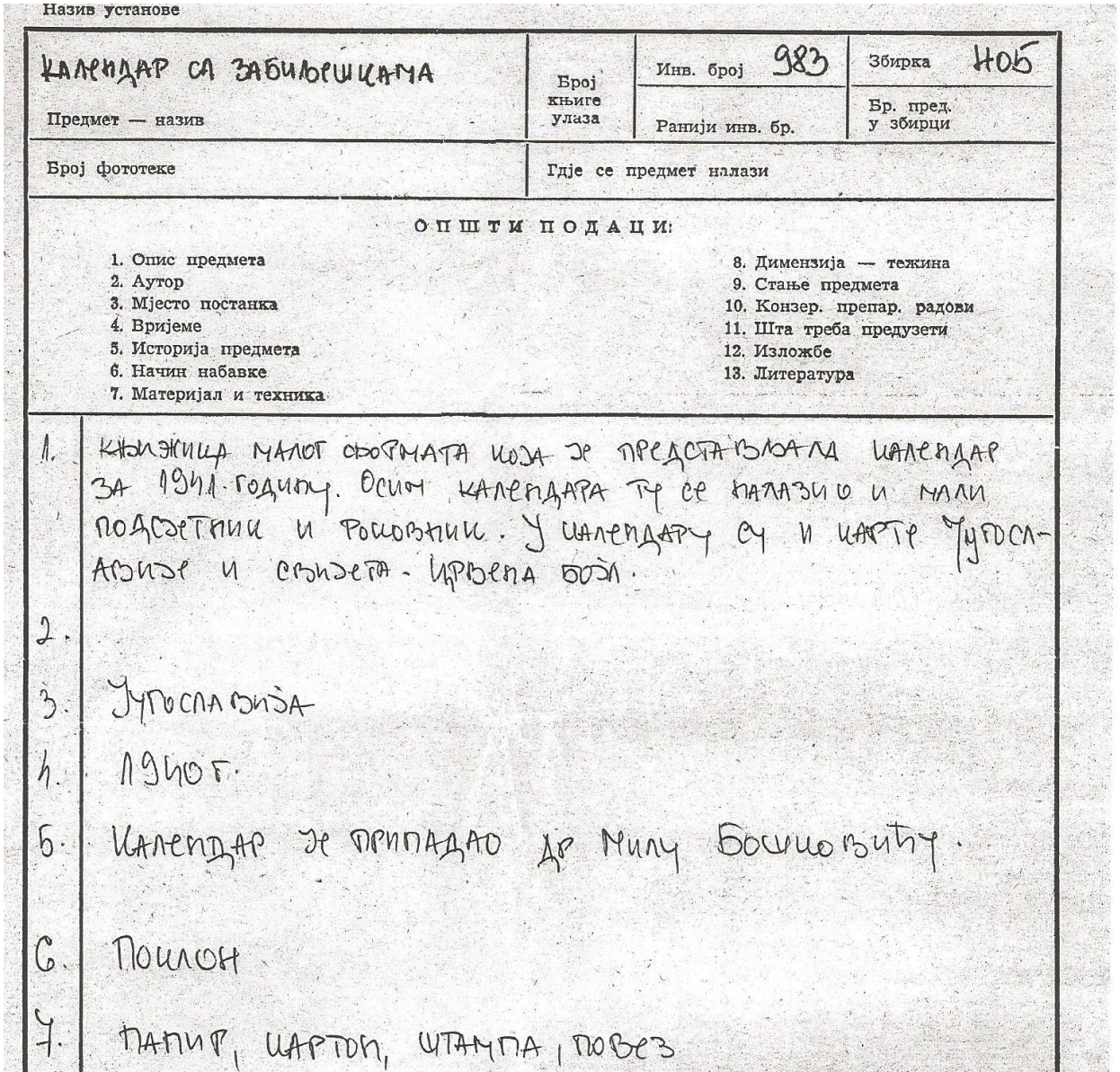
FocusOPEN - Technology

- FocusOPEN is delivered using a multi-tier architecture that can be distributed across one or more hosts:
  - Web Application: The core ASP.NET DAMS where most of the business logic is contained
  - Database: SQL Server RDBMS
  - File system: Assets are stored in the file system so any accessible file storage device can be used
  - Media Processing: A dedicated Asset Processing Server (APS) is provided as a Windows service

FocusOPEN – Pilot phase 1

- In the phase 1, we configure DAMS based on the FocusOPEN open source software, set it on web server at Faculty of Mathematics and upload and catalogue some of digital resources from Bar County Museum
- During phase 1, people from Faculty of Mathematics were responsible for software, computers and services; people for Bar County Museum were responsible for uploading and catalogizing digital resources

FocusOPEN - Screenshot



Назив установе

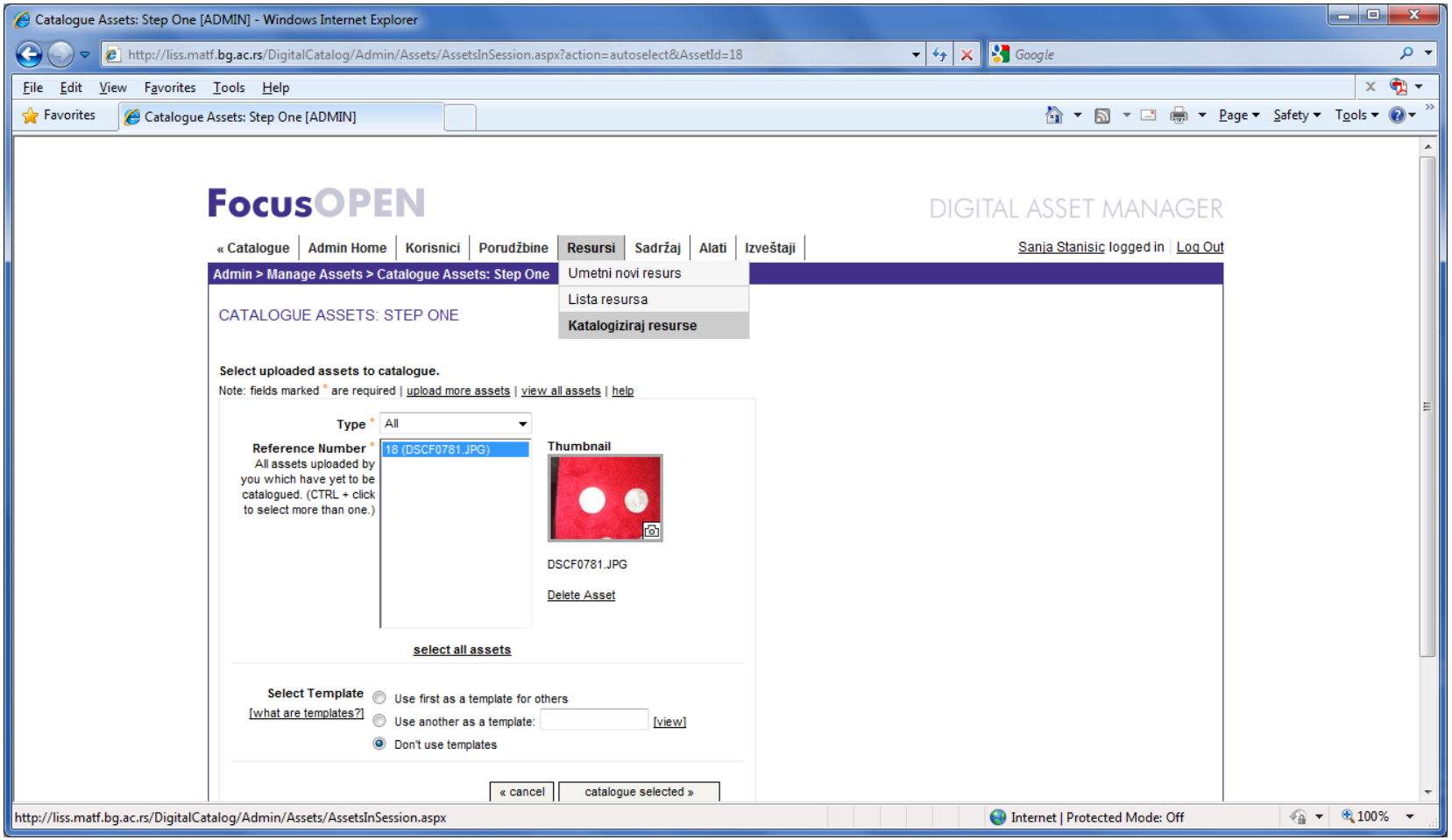
КАЛЕНДАР СА ЗАБИЉЕШКАМА Предмет — назив	Број књиге улаза	Инв. број 983 Ранији инв. бр.	Збирка Н05 Бр. пред. у збирци
Број фототеке	Гдје се предмет налази		

ОПШТИ ПОДАЦИ:

1. Опис предмета
2. Аутор
3. Мјесто постанка
4. Вријеме
5. Историја предмета
6. Начин набавке
7. Материјал и техника
8. Димензија — тежина
9. Стање предмета
10. Конзер. препар. радови
11. Шта треба предузети
12. Изложбе
13. Литература

1. КЊИЖИЦА МАЛОГ ФОРМАТА КОЈА ЈЕ ПРЕДСТАВЉАЛА КАЛЕНДАР ЗА 1941. ГОДИНУ. ОСИМ КАЛЕНДАРА ТУ СЕ НАЛАЗИЛО И МАЛИ ПОДСЈЕТНИК И РОКОВНИК. У КАЛЕНДАРУ СУ И КАРТЕ ЈУГОСЛАВИЈЕ И СУСЈЕДА - ЦРВЕНА БОЈА.
2.
3. ЈУГОСЛАВИЈА
4. 1940 Г.
5. КАЛЕНДАР ЈЕ ПРИПАДАО ДР МИЛУ БОШКОВИЋУ.
6. ПОКЛОН
7. ПАПИР, КАРТОН, ШТАМПА, ПОВЕЗ

FocusOPEN - Screenshot



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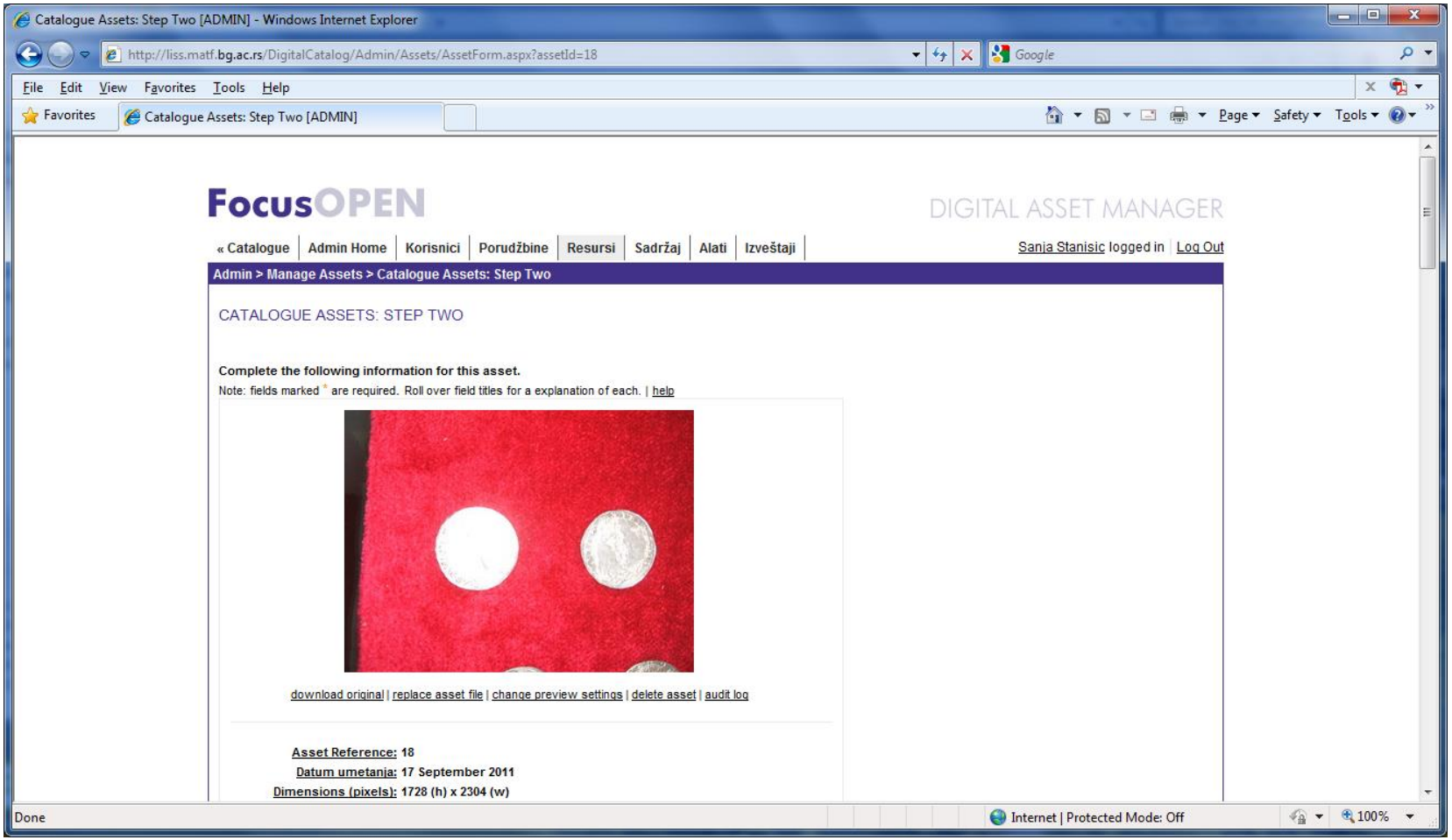

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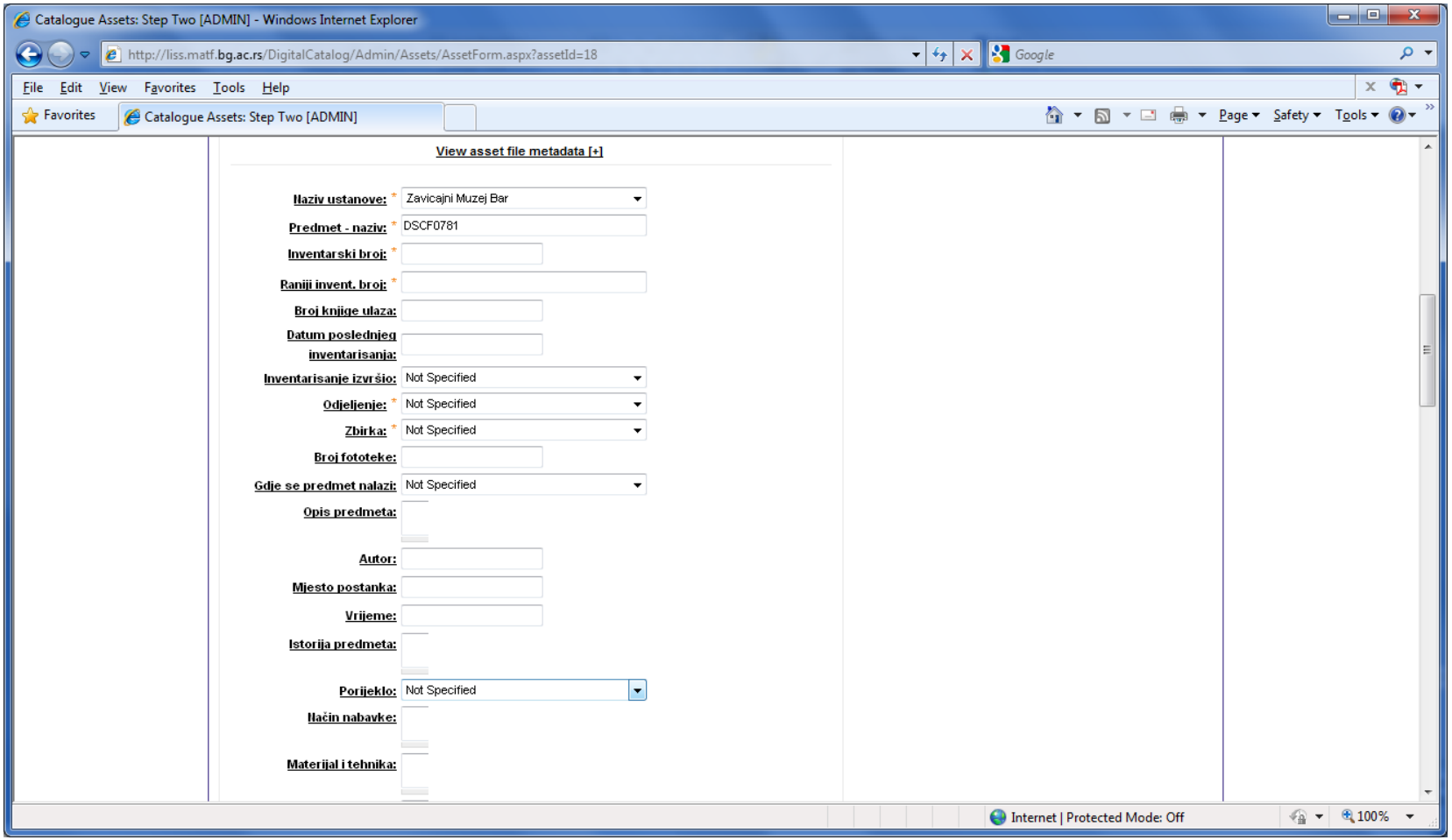
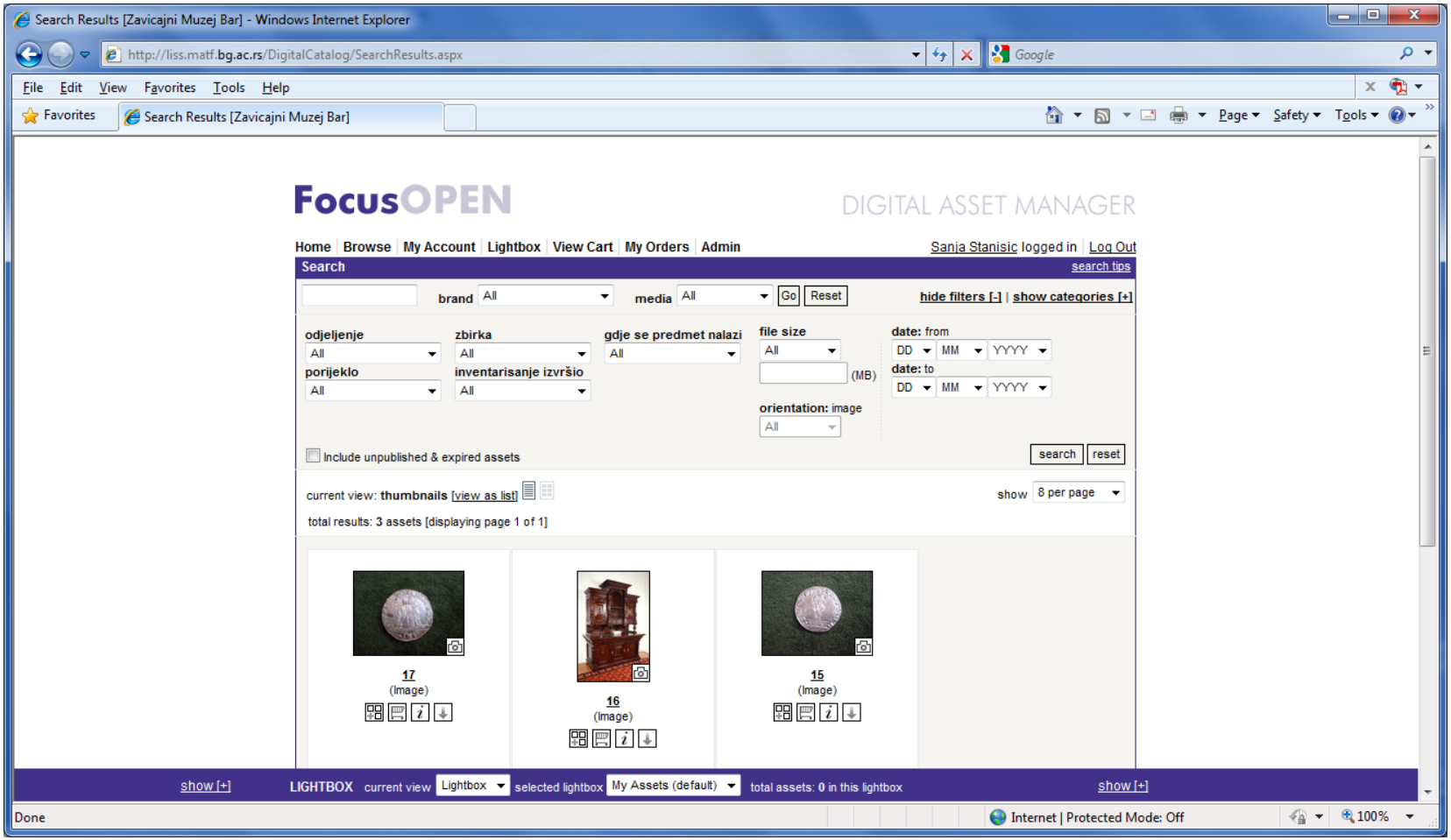


FocusOPEN - Screenshot



FocusOPEN – Pilot phase 2

- Phase 1 shows that FocusOPEN can be successfully used in Bar County Museum for digital resource management.
- Now, when phase 1 is successfully finished, team is upgrading and localizing FocusOPEN open source system – restructuring it in order to obtain multi-language support.
- On that way, FocusOPEN will be able to simultaneously supports two or more languages.

FocusOPEN – Pilot phase 2

- Such restructuring requires changes in database, in business logic and in user interface
- Team should not breach the license agreement, so repository for modified source code (and modified database) have to be accessible from every web page of modified solution.
- Assets that are uploaded during phase 1 should be preserved – changes should not destroy previously uploaded assets and current metadata

Conclusion

- Proposed course organization fulfills the need for practice and increases experience
- Students are doing something good for programming community
- Working on open source projects, in average, results with better understanding of the problem by students
- There are no legal issues
- Efforts of teachers and students allows promotion of the faculty

Conclusion

- Second year of project-based course organization, first year with open source projects
- In current school year, 30 students attended the course ‘Software development 2’
- Teacher and teaching assistant(s) should put more effort in order to make this work
- None of the teams finished their project within one semester

Contact and questions

- Source code

  Qlab:

  http://qlab.codeplex.com/

  FocusOPEN:

  http://www.digitalassetmanager.com/

- Contacts:
  - vladaf@matf.bg.ac.rs
  - vladofilipovic@hotmail.com