



# FROM ACADEMIC PROJECT TO PRODUCTION SOFTWARE BASED ON JAVA WEB-TIER CMS APPLICATION

J. Wojciechowski  
Computer Center  
Lodz University of Technology

Lodz University of Technology web site  
<http://www.p.lodz.pl>

In 2006 author introduces custom CMS for Lodz University of Technology based on Java Enterprise Edition (Department of Microelectronics and Computer Science origin)

Functionality:

- multi hierarchy
- multi-domain
- multi-language
- SEO ready (based on Google secrets – a.o. friendly urls)
- ACL (access control lists)
- security ready – custom techniques
- custom daily Newsletter
- site map (cached)

Custom CMS introduced decentralization of responsibility for the information which was put to the web by administrative departments of Lodz University of Technology (Promotion department supervision)

Custom designed (tailored) for demands of administration of Lodz University of Technology  
Functionality oriented design and implementation phase

Performance oriented refactor implementation phase – based on doctoral studies experience\* (caused by increasing number of visitors)

-From 2010 till 2013 performance gain practices applied in web-tier CMS

-2013 mobile ready responsive front end design (html front end prepared by third party)  
-Author implemented new front end with CMS

-Author prepared SEO outline/document "Zwiększenie widzialności Politechniki Łódzkiej w Internecie" for implementation in all web sites of TUL within domain „p.lodz.pl”

-2014/2015 maintenance started by Multimedia Center

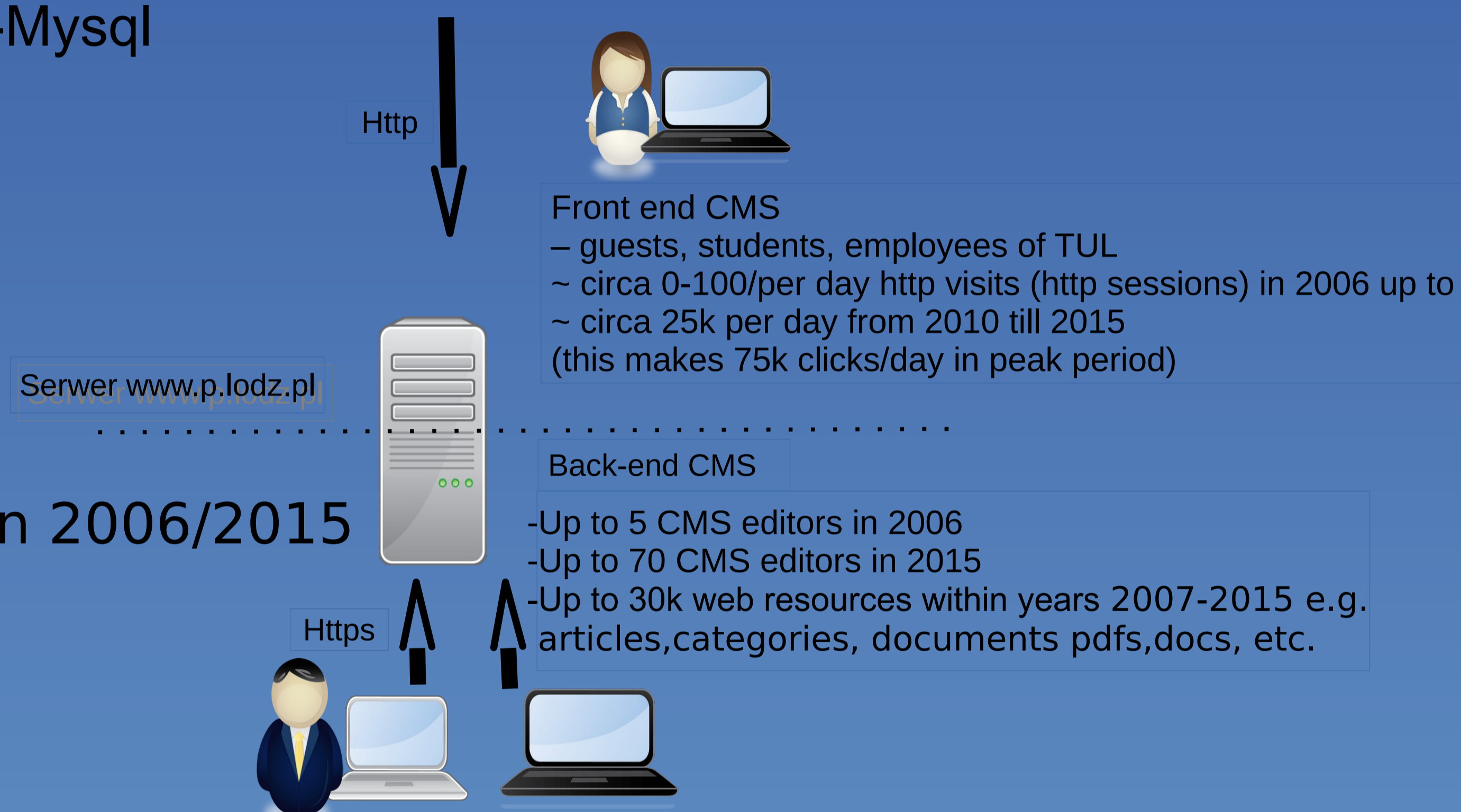
-2013-2015 satisfied Google SERP outcomes : keyword „Politechniki” -top 5

- awesome performance ~<1s
- simplicity of maintenance
- ease of administration

→ In 2005  
-plain html 4.01 transitional

→ In 2006/2007  
Technology involved:  
-Multi-tiered Java Enterprise Edition (JEE) version 5  
-Java Server Pages (JSP)  
-Java Servlets  
-Java Standard Tag Library (JSTL)  
-ExpressionLanguage (EL)  
Struts 1.2 - Model View Controller (MVC) framework  
-Object Relational Mapping (ORM) Hibernate 2.x  
-Mysql

→ In 2006/2015



→ In 2010/2013  
-switch from Hibernate 2.x to JDBC DAO for front-end  
-bottlenecks removal (coping binary data from database to static web data)  
-memory-caching, caching objects in ApplicationContext and re-addressing them to HttpServletRequest for every request in the session for the presentation layer  
-memory leakage removal by explicit releasing resources in whatever path of execution of the code  
-coordination between threads – synchronization blocks Application  
-switching to non-blocking IO web container Tomcat 6.x  
-vertical scaling (virtualization & additional CPUs or memory)

→ -Increased number of clicks in domain „p.lodz.pl” up to ~1mln per month in peak period

\* "Translation method of Coloured Petri Nets models towards Java Web application schema based on multi-tier distributed authorization system" J.Wojciechowski - Phd dissertation, 2009, Library of Lodz University of Technology