Brihaspati: opensource free software e-learning platform

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Basic Components

- Learner
- Contents
- Mentor/ instructor
- Framework for interaction
Opensource freeware framework

- Development governed by users
- Usually somebody makes it for his own use and then shares it.

Advantages
- One can modify it as per requirements
- Availability of source code – chances of trojan horses minimal
- Usually buildup happens in iterative way
- Only important and required features are build earlier
- Software released continuously

**Disadvantage**

- All features may not be there in the beginning - they get added with time
- No instant support available – usually discussion groups or mailing lists are there
  - Usually bad GUI (look and feel) in beginning, but improves with time.
E-learning frameworks

- **LCMS (learning content management system)**
  - Content publishing and management
  - Learner tracking - missing or very limited

- **LCMS with Interaction tool**
  - Features like chat, whiteboard, mail, discussion groups
  - Mentor/ instructor and learner, and learner-learner interaction feasible
LMS (learning management system)

- Learner behavior tracking feasible
- Requires content packaging
- Requires content player
- Mechanism at backend to whom content player sends behaviour updates
  - In Brihaspati-2, it is planned to use javascript in front end and backend the action and screen classes in turbine.
LMS (contd.)

- Mechanism to analyze learner behavior
  - What information can be deduced?
  - For what this information can be used.
    - Most preferred learning paths for majority of learner
    - Can be used to automatically reorganize the collection of content objects.

- SCORM compliance – is the current approach in Brihaspati development.

- Mostly LCMS develop into LMS at later stage
Live interactive classroom tools

- Conventional classroom teaching methodology ported to internet
- Students can be anywhere for attending the lectures (but at the same time)
- These interactions can be recorded and archived as content in LMS
- Usually will requires good bandwidth in networks and multicast connectivity. (IPv6 infrastructure will provide it most likely)
LCMS/LMS frameworks

- Usually build over some web application framework
  - Most popular J2EE
  - Alternative Turbine – jakarata.apache.org

- Turbine is opensource, freeware with apache license.
Brihaspati

- Built using turbine framework – turbine 2.1
- Continuously tested in IITK while being developed
- Distributed via sourceforge.net site under opensource liscense.
- All basic feature for administrator, instructor and student are present
Brihaspati-2

- Learning from Brihaspati experience
- Based on turbine 2.3
- Modified structure
  - English/ Hindi/ Urdu user interface
  - content author and instructor separation
  - Content repository
  - Question bank repository
  - SCORM packager and RTE
  - Shared authoring of content (wiki)
  - Remote courses (distributed Brihaspati)
Brihaspati_sync

- Live lecture delivery over multicast network
- Delivery over unicast network using multicast to unicast gateways (proxies)
- Common database for Brihaspati-2 and Brihaspati_sync
- Layered media structure to take care of available bandwidth variations (receiver driver layered multicast technology)
URLs

- Downloads [http://sourceforge.net/projects/brihaspati](http://sourceforge.net/projects/brihaspati)
- Discussion group for support and help [brihaspati_iitk@yahooogroups.com](mailto:brihaspati_iitk@yahooogroups.com)
- IITK installation [http://brihaspati.iitk.ernet.in/](http://brihaspati.iitk.ernet.in/) (use login guest password guest)
Status

- 64 known organization using or interested in Brihaspati
- Some of them
  - TIET, Patiala
  - NLSUI, Bangalore
  - IIT Madras
  - NPTEL programme (MHRD)
  - Punjabi University, Patiala
  - DOEACC centers (MCIT)
Future Development

- Content authoring tools for adaptive learning environment systems
- Instructor evaluation system
- Feedback collection (surveys) mechanism
- Maven based build (currently it is Ant based)
- Modular architecture (use of component registry)
- Component to make multiple redundant server feasible
- Certain modules will be used for revenue generation for further funding of the project
Research initiatives

- Efficient codecs for layered audio-video
- Bandwidth estimation techniques and development of estimators
- Module for creation of virtual multicast network over unicast, http-tunnelling
Teachers’ role

- Teaching an art
- Artist need to learn to optimally use the medium for expressing himself
- Old medium was chalk, board, speech, acting, handouts, interaction during project assignments.
- New medium – email, discussion board, text and graphical notes, multimedia content, exchange of ideas and notes (over internet) while doing project assignments – collaborative authoring.
- Document archival experts – need to find ways to filter and archive the resulting outputs for future reference – need to work closely with the new teacher.
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