Learning Management System
To Serve Employment Ontario Offices:
Requirements Document

BACKGROUND

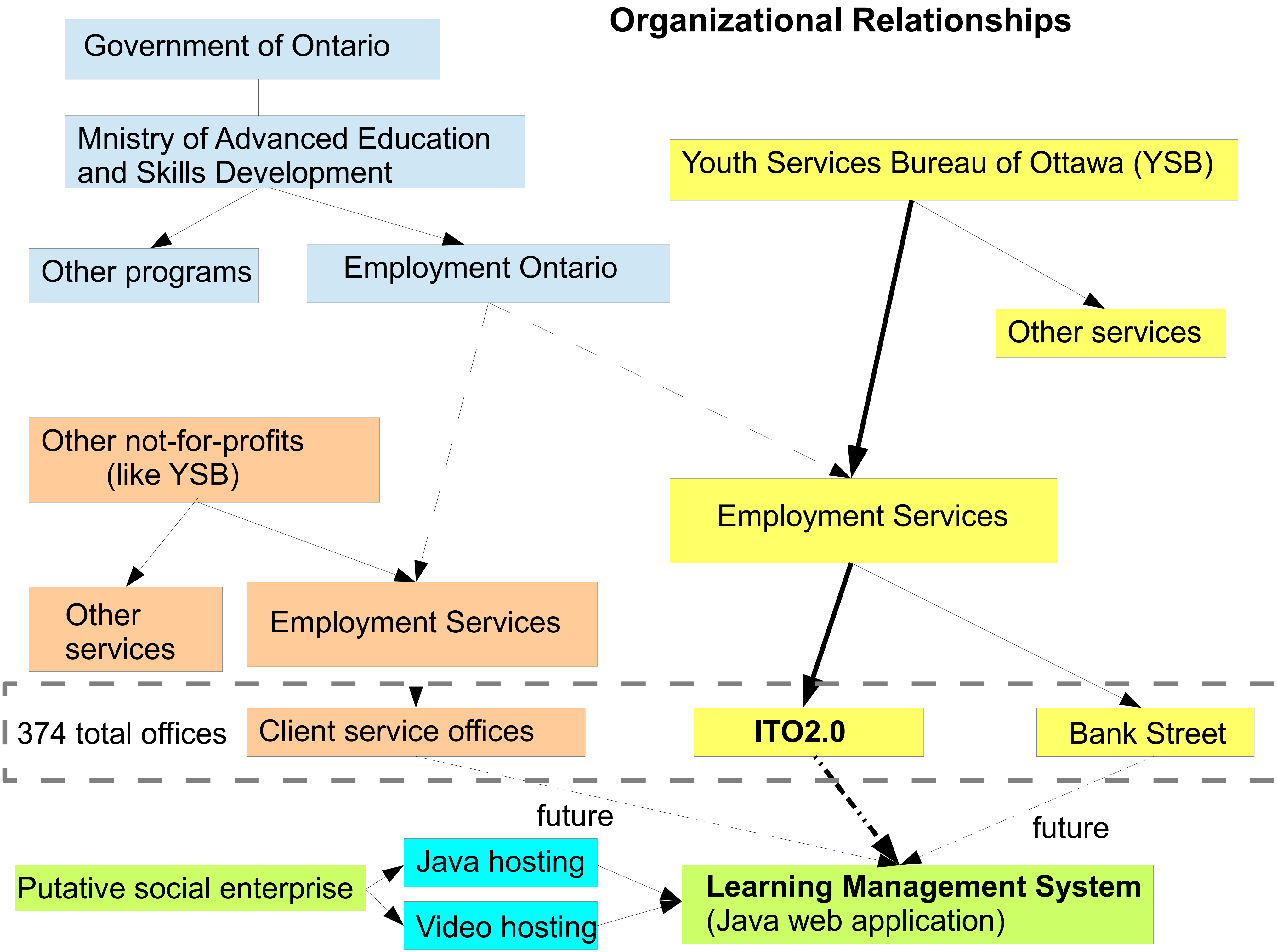
Employment Ontario provides employment services in partnership with a number of not-for-profit organizations. It maintains no client-services offices of its own but relies on partners to run 374 such offices across the province. The offices run under the oversight of Employment Ontario and receive from it funding in proportion to the volume of client services they provide.

ITO2.0 is the employment services branch of the Youth Services Bureau of Ottawa (YSB), a not-for-profit that operates in the Ottawa regions, and focuses on employment services for clients seeking employment in the information technology (IT) sector.

ITO2.0 would like to be able to provide training services to clients on line and on demand. It is seeking a software solution in the nature of a learning management system (LMS) that would fulfill the following criteria:

- Video, pdf, text and image resources available on line and on demand by clients who have registered with ITO2.0 and have been provided by it with log-in credentials.
- User experience is to be fully bilingual, in English and French, to comply with Government of Ontario policies and regulations.
- LMS software will be fully compliant with Government of Ontario accessibility standards.
- LMS software will to the extent possible measure and verify client usage of training materials made available, with measurements to include not only log-ons but duration of use. Provision should also be made for evaluating client retention of the content of training materials.

Other Employment Ontario partner offices have needs similar to those of ITO2.0, and the software should be designed with the aim of being usable by these other partners.


Organizational Relationships
Government of Ontario
Mnistry of Advanced Education and Skills Development
Other programs
Employment Ontario
Youth Services Bureau of Ottawa (YSB)
Other services
Other not-for-profits (like YSB)
Employment Services
Other services
Employment Services
374 total offices
Client service offices
ITO2.0
Bank Street
future
future
Java hosting
Putative social enterprise
Video hosting
Learning Management System (Java web application)

Design Principles

- Ease of use
  - Simple navigation:
  - One click from any point to any other point;
  - Intuitive: No training required
- Bilingual
- Meets Ontario accessibility standards
- Avoids collecting personal data subject to privacy concerns
- Measures client usage and retention of materials
- Data should be organized in relation to individual clients and not in relation to courses or academic terms

Assumptions

- Software will be provided as a hosted service
- Software will constitute a single, independently-hosted application accessed by links from partner organization websites
- Software will **not** use machine-to-machine data transfer using REST or SOAP because it is not possible to install data transfer clients on office systems

Desiderata

- Duration of client usage of resources will be measured, in addition to log-ons.
- Attention will be paid to the authentication of clients, to confirm that users are clients themselves.
- Authenticity/accuracy of usage records must satisfy Employment Ontario.
- Video presentations are to be an essential, primary resource medium.

Permission Levels

Users will be able to access the LMS software at four permission levels:

- **Client**: ITO2.0 clients (job seekers) will have access to training materials, calendars, notifications and records of their own records and evaluations. They will be able to send messages to their employment consultants/coaches only. They will not be able to change calendar entries or control other functions of the LMS software.

- **Employment consultant/counselor/coach**: Consultants will be able to view all training materials, participation and evaluation records for their individual clients only. They will likewise only be able to send messages to these individual clients. Similarly, they will be able to make training assignments for their own clients only.

- **Office administrators**: Office administrators will be able to view training materials, participation and evaluation records for all clients served by the office. They will be able to assign clients to consultants. Office administrators will be able to create calendar events and notifications to be viewed by users at all permission levels within the office.

- **Super-administrators**: Super-administrators will have full access and control over all records and functions of the LMS for all offices served. This access is for purposes of maintenance of services.

ACCOUNT CREATION

- A master account for a particular office will be created by a super-administrator when an agreement has been reached that the office will use the LMS application. The master account will include the name and contact information for the office, a display name and logo. These items will be displayed on instances of the application reached by links from the office's website.

- Office administrators will be able to create accounts for their offices at all permission levels, including those for additional office administrators. Account records will include only an auto-increment id, the user's first and last names, email address, a username (if the user's email address is not used, as is preferred) and a password.
  Records of other information related to a user (assignments and usage records) will be linked to the account records by a database join table. No records in this application would contain user information that is a matter of privacy concerns.

- Accounts for office administrators and consultants will require a security question to create enhanced security for these accounts. These users will be prompted to create
  security questions when they first log in and to change them periodically.

- Office administrators will only be able to edit all information in user accounts, except for the auto-increment record id.

LINKS FROM PARTNER OFFICE WEBSITES

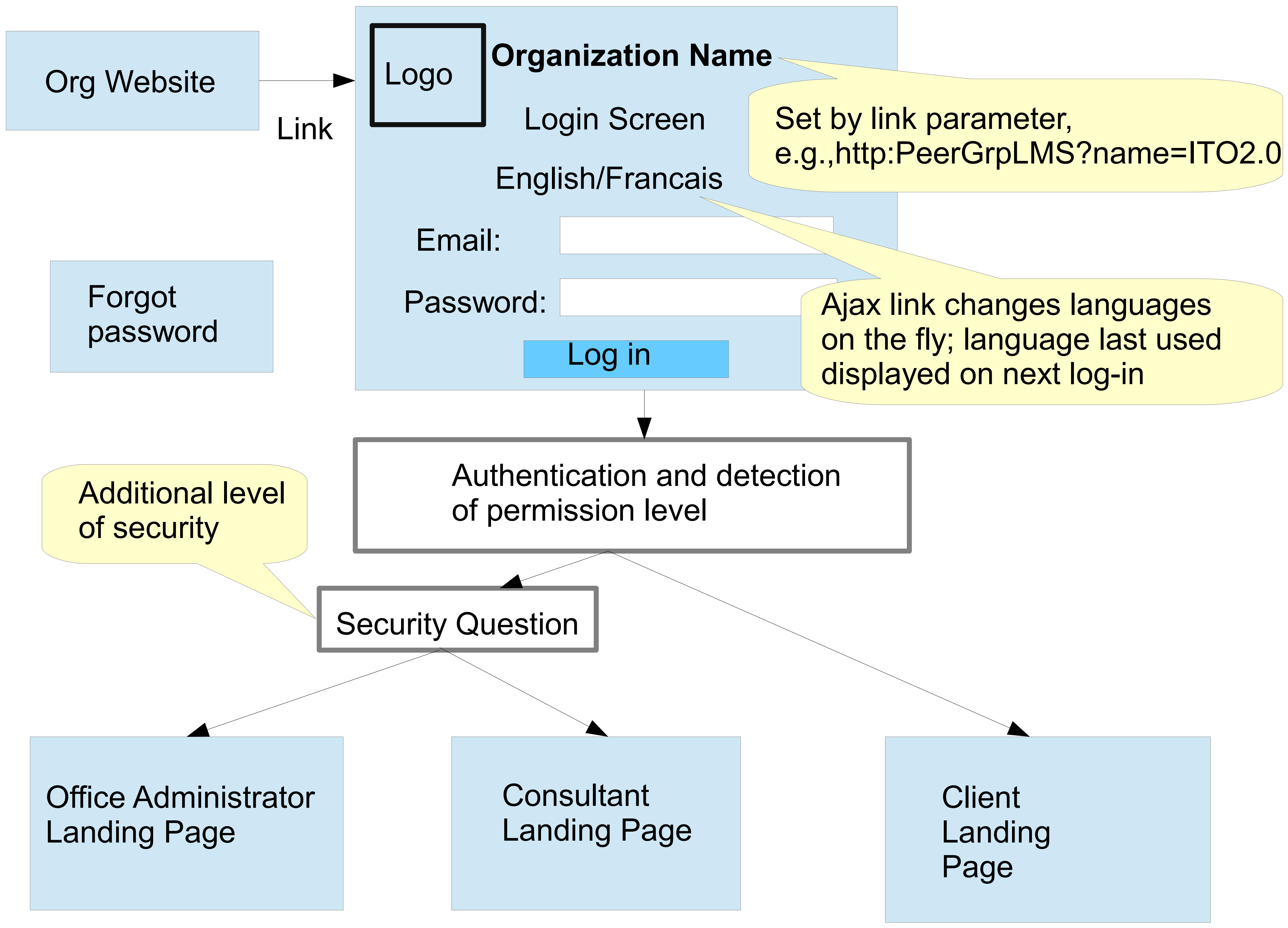
Users at all permission levels will have access to an instance of the LMS application for the office with which they are associated by means of a link from the office's website.

Users will have to log in to the LMS application. (Office websites may not require a log-in and, because it will probably not be possible to install a REST client on office websites, passing authentication from a website to the application will not be possible.)

Log-ins by office administrators and consultants will require answering a security question to provide an additional layer of security for these accounts.

Links added to office websites will include an officer identifier as a GET parameter in the url. This will serve the necessary purpose of associating user access permissions and information with a particular office.

The office's display name and logo, provided when the office's master account is created, will be displayed on instances of the application to which users associated with the office log in.


Org Website
Link
Logo
Organization Name
Login Screen
English/Francais
Email:
Password:
Log in
Set by link parameter, e.g.,http:PeerGrpLMS?name=ITO2.0
Ajax link changes languages on the fly; language last used displayed on next log-in
Forgot password
Authentication and detection of permission level
Additional level of security
Security Question
Office Administrator Landing Page
Consultant Landing Page
Client Landing Page

CLIENT FUNCTIONS

1. Log in to the LMS application for the employment Ontario office with which they have registered. Client will utilize a user-name (their own email address) and a password provided by the office.
2. View calendar and notifications created by office administrators;
3. View assignments/training programs created by consultants;
4. View training materials and confirm viewing;
5. Complete evaluation exercises;
6. View other resources, reference materials;
7. Send messages to consultants;
8. View messages from consultants;
9. View their own participation and evaluation records;
10. Obtain replacement passwords by means of a 'forgot password' function

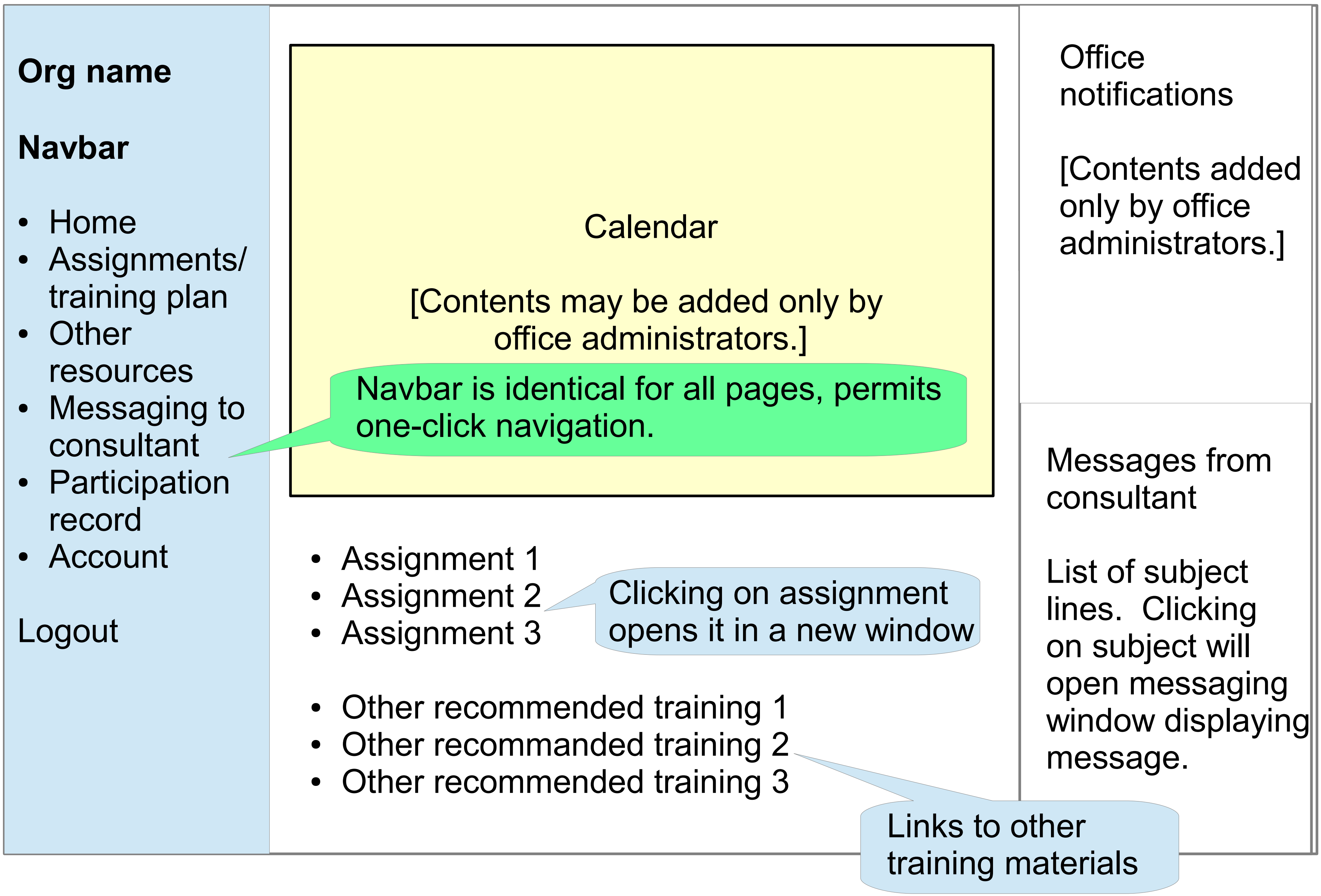
Client Record Creation

- Clients will initially present themselves physically at office;
- Clients' personal information collected by the office and subject to privacy protections will **not** be transmitted to or recorded within the LMS application;
- Clients will be provided with a user name and password for the LMS by the office after registering;
- Clients will sign a form stating that only the client themselves will view the online resources. Only the client will provide input when logged in using the provided user name and password.

Client Usage Records

- Date/time client accesses a particular resource is to be recorded;
- Duration of each use is to be measured;
  - Resources are to be segmented so as to require repeated user actions that can be recorded;
  - Resources are to include a 'log-out' dialog to be clicked upon completion (with password?);
- A reasonable maximum duration of use will be set for a given resource and client
  - Usage. Any time beyond this maximum usage will not be recorded;
- Where appropriate, competency-based training should be enabled:
  - Clients must have completed/viewed prior segments to view subsequent segments;
  - Option to require successful evaluation (quizzes) of prior segment learning
    - before subsequent segments are viewable.

Client Landing Page



Client Assignments Page

Org name

Navbar

- Home
- Assignments/ training plan
- Other resources
- Messaging to consultant
- Participation record
- Account

Logout

Video or text training materials in training plan created by consultants and individualized for each client will be displayed here, with navbar always displayed to permit easy navigation to other menu items.

Videos may be divided into segments, with 'calls to action' for each, either simply confirming completion or testing for retention of content. Confirmatory/evaluation materials will also be displayed in this window.

Client Other Resources Page

Org name

Navbar

- Home
- Assignments/ training plan
- Other resources
- Messaging to consultant
- Participation record
- Account

Logout

\+ Preparing Effective Resumes – Three Styles
by Aimah Reiter

Clicking on resource title opens resource in a new window

\+ Navigating a Job Fair
by U. Seful Udweiss

\- IT firms in the Ottawa Region

A family tree of IT firms in the Ottawa region in the form of a jpeg image.

\+ How to Succeed in Interviews
by ITO staff

Hovering over resource title expands an annotation block

Client View Other Resources Page

Org name

Navbar

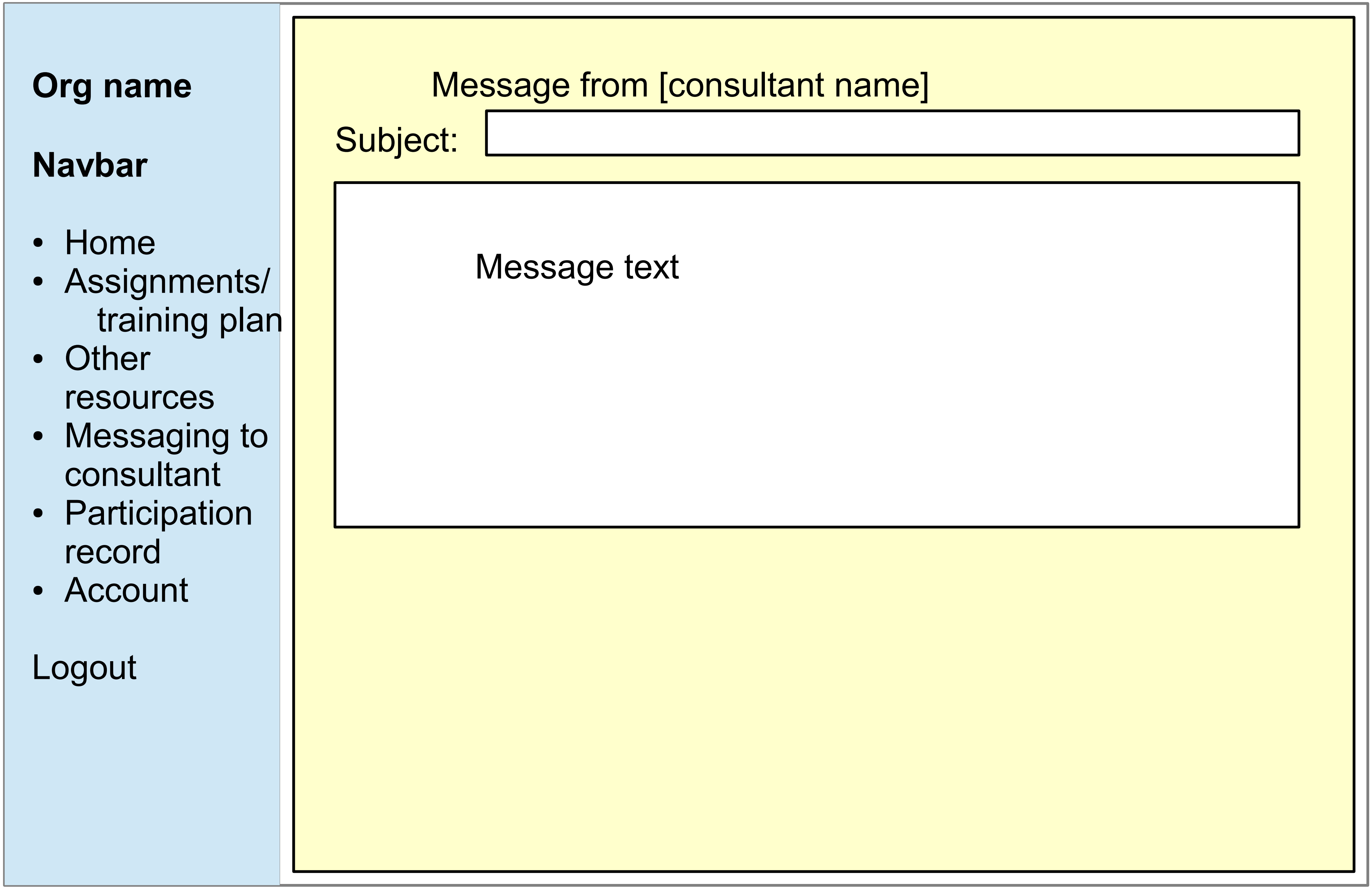
- Home
- Assignments/ training plan
- Other resources
- Messaging to consultant
- Participation record
- Account

Logout

Other resources/reference materials will be displayed here, with navbar always displayed to permit easy navigation to other menu items.

Client View Messages Page

[Page opens when client clicks subject line of message in the messages box on Client Landing Page.]



Client Send Message Page

Org name

Navbar

- Home
- Assignments/ training plan
- Other resources
- Messaging to consultant
- Participation record
- Account

Logout

Message to [consultant name]

Subject: [Required field to enable convenient display.]

Message text

[Size of messages will be limited to 511 characters.]

Client Participation Record Page

Org name

Navbar

- Home
- Assignments/ training plan
- Other resources
- Messaging to consultant
- Participation record
- Account

Logout

Assignment 1

- date/time logged in
- duration
- date/time logged in
- duration
- date/time logged in
- duration
- evaluation results

Assignment 2

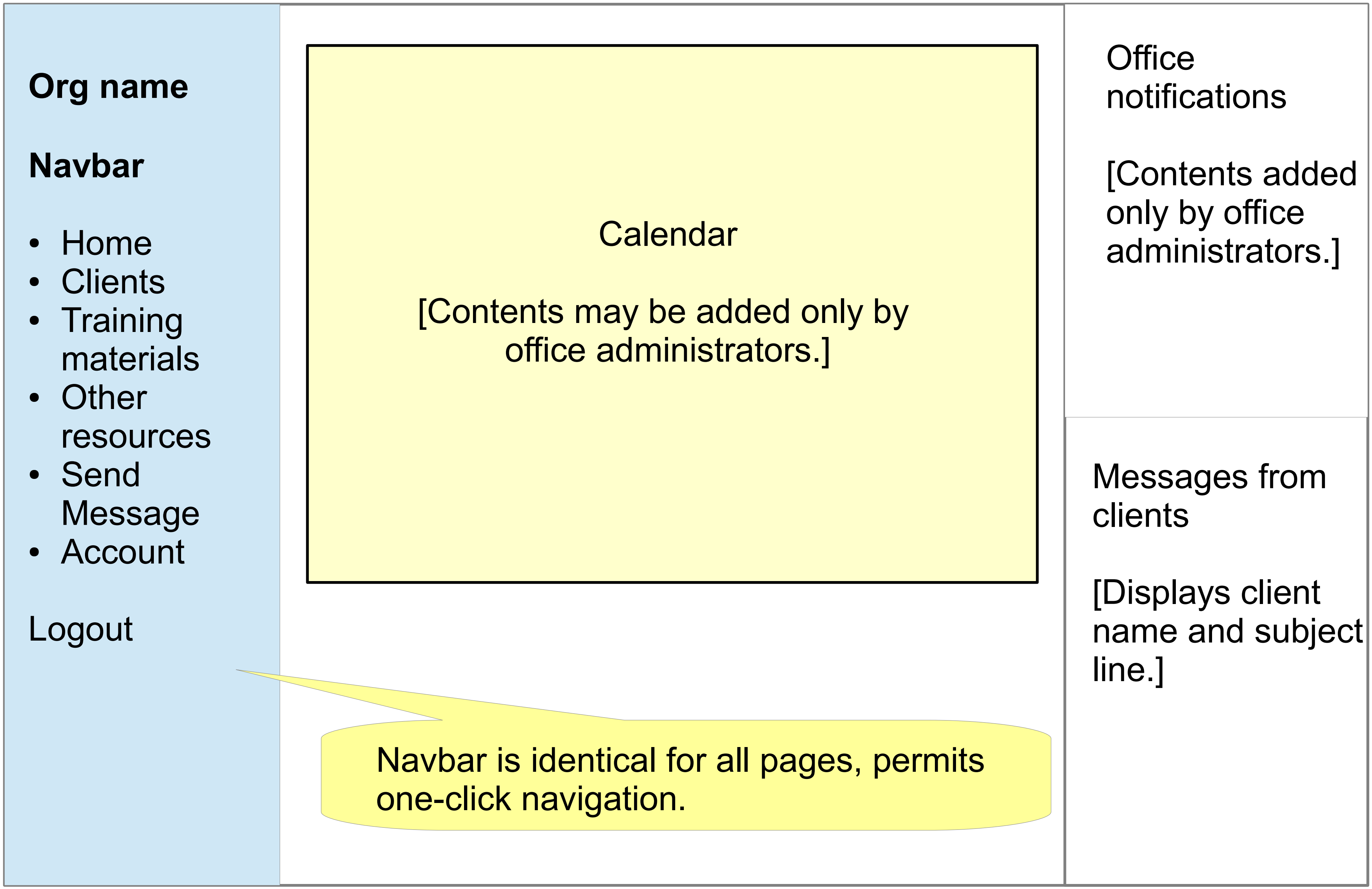
- date/time logged in
- duration
- date/time logged in
- duration
- date/time logged in
- duration
- evaluation results

And so forth

CONSULTANT FUNCTIONS

- Log in to the instance of the LMS application belonging to the office in which they work, using a user-name (their own email address), a password provided by the office and answering a security question.
- View calendar and notifications created by office administrators;
- View a list of clients served with summary for each of open and completed assignments:
  - clicking on a client name will open a screen displaying details:
  - assignments/training plan, including dates when assignments were made;
  - usage and evaluation records;
  - an option to add new assignments (should generate automated email to the affected client);
- View a list of available training materials;
- View list of other resources, reference materials;
- View messages from clients;
- Send messages to clients;
- Obtain own replacement passwords by means of a 'forgot password' function.

Consultant Landing Page



Consultant Clients Page

Org name

Navbar

- Home
- Clients
- Training materials
- Other resources
- Send Message
- Account

Logout

- Client 1

Add assignment

Recommend other training

- Assignments
  - Assignment 1
    - Login 1 date/time, duration, evaluation
    - Login 2 date/time, duration,evaluation
  - Assignment 2
    - Login 1 date/time, duration, evaluation
    - Login 2 date/time, duration,evaluation
- Other training recommendations
  - Training material 1
  - Training material 2

Clicking here opens a menu of training materials

+ Client 2
+ Client 3
+ Client 4

Hovering over client name expands info tree-table

Consultant Available Training Materials Page

[permits consultants to review what is available to assign to clients]

Org name

Navbar

- Home
- Clients
- Training materials
- Other resources
- Send Message
- Account

Logout

Assisted services training

+ Introductory Orientation Program View

+ Resume Workshop View

- Preparing for Interviews View

40-minute video presentation divided into two 20-minute segments, with retention quiz following each. Presentation by Iman Expert

Other training materials

+ Using Social Media in a Job Search View

+ Etc.

+ Etc.

Title of course expands to show annotations on content

Consultant Other Resources Page

[permits consultants to review available reference resources]

Org name

Navbar

- Home
- Clients
- Training materials
- Other resources
- Send Message
- Account

Logout

+ Preparing Effective Resumes – Three Styles
  by Aimah Reiter

Clicking on resource title opens resource in a new window

+ Navigating a Job Fair
  by U. Seful Udweiss

- IT firms in the Ottawa Region

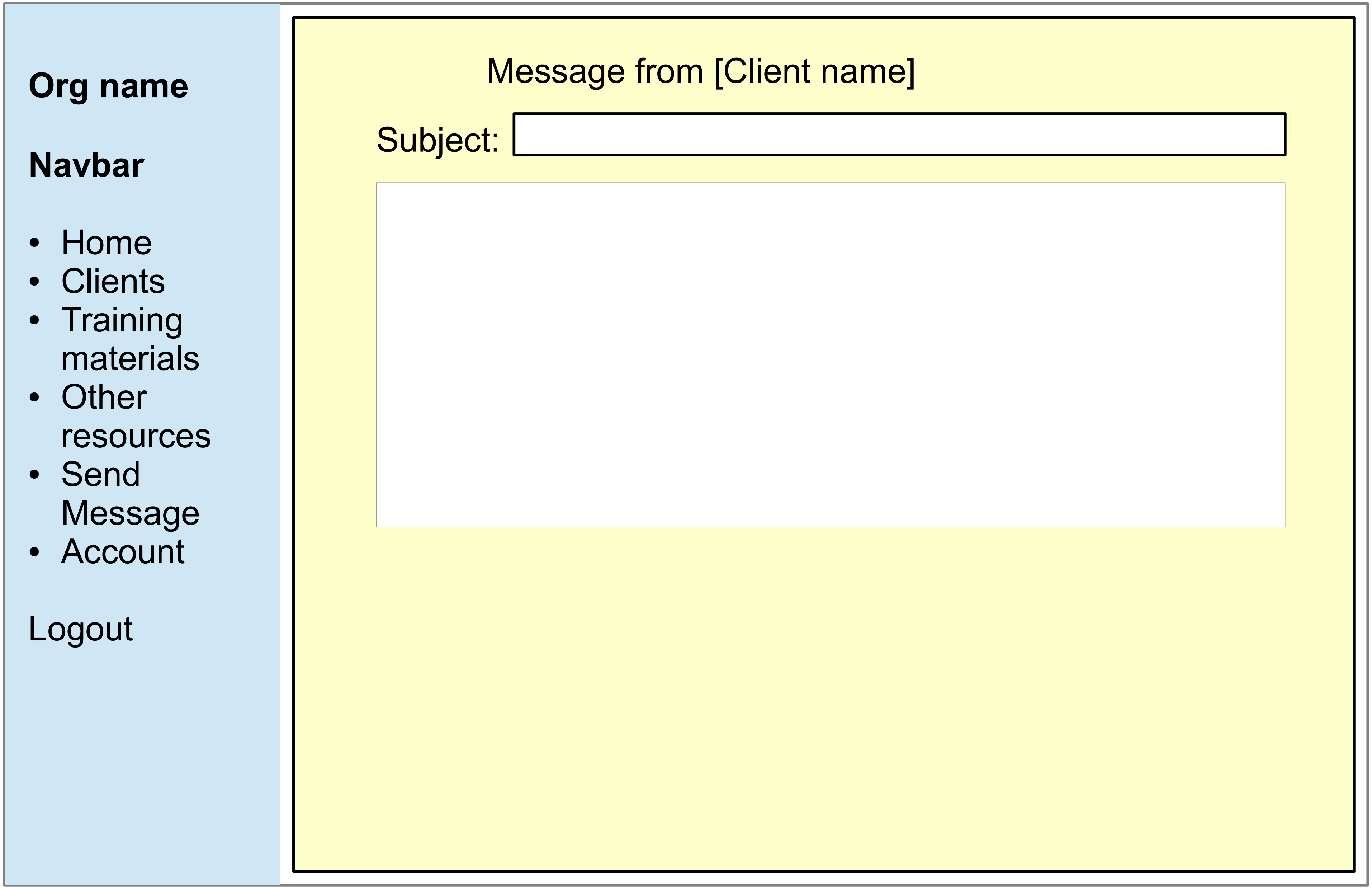
  A family tree of IT firms in the Ottawa region in the form of a jpeg image.

+ How to Succeed in Interviews
  by ITO staff

Hovering over resource title expands an annotation block

Consultant View Message Page

[Page opens when consultant clicks message subject line in messages box on Consultant Landing Page.]



Consultant Send Message Page

Org name

Navbar

- Home
- Clients
- Training materials
- Other resources
- Send Message
- Account

Logout

Message to [Client name]

Subject: [Required field to enable convenient display.]

Message text

[Size of messages will be limited to 511 characters.]

OFFICE ADMIN FUNCTIONS

- Log in to the instance of the LMS application belonging to the office in which they work, using a user-name (their own email address), a password provided by the office and answering a security question.
- View calendar and notifications created by office administrators;
- Add calendar events;
- Create/edit notifications;
- View a list of available training materials;
- View content of evaluation materials;
- Create/edit evaluation materials and link them to training material segments;
- View list of other resources, reference materials;
- Add new resources, reference materials;
- Assign clients to consultants;
- View list of consultants, with lists of clients each serves and summaries of assignments and usage records for each;
- Generate reports showing numbers of clients using the LMS and usage by each.
- Obtain own replacement passwords by means of a 'forgot password' function.

[Creation and editing of video training materials will be done external to the LMS application and will be added by a super-admin.]

Office Administrator Landing Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

Calendar

[Events can be added to the calendar on this screen.]

Navbar is identical for all pages, permits one-click navigation.

Office notifications

Click to edit.

- Notification 1
- Notification 2
- Notification 3
- Notification 4

Office Administrator Notifications Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

Create/edit Notification

Subject:

Content:

Start date/time: Date picker

End date/time: Date picker

Office notifications

Click to edit.

- Notification 1
- Notification 2
- Notification 3
- Notification 4

Office Administrator View Training Materials Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

+ Introductory Orientation Program View

+ Resume Workshop View

- Preparing for Interviews View

40-minute video presentation divided into two 20-minute segments, with retention quiz following each. Presentation by Iman Expert

+ Using Social Media in a Job Search View

+ Etc.

+ Etc.

Title of course expands to show annotations on content

Office Administrator View/Edit Evaluation Materials Page

Org name
Navbar
- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

\+ Introductory Orientation Program

\+ Resume Workshop

\- Preparing for Interviews
- Segment 1: [no evaluation materials]
- Segment 2: Retention quiz

\+ Using Social Media in a Job Search

\+ Etc.

\+ Etc.

Hovering over title of course expands to show segments of video presentation with evaluation materials if they have been created. Click on segment to create/edit evaluation materials.

Office Administrator Create/Edit Evaluation Materials Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

Evaluation material for 'Preparing for Interviews, segment two

Create text for questions

Number word

Replace with blank

Undo blank

Select question type:

Dropdown:
True/false
Multiple choice
Multiple select
List matching
Fill in the blank

Appropriate form for question type appears here.

Number	Type	Content	Answer
1	True/false	Arriving early means you are too needy	false
2	Multiple select	Dos and don'ts	**Be confident** Exaggerate good points **Be familiar with employer's business** Bring gifts
3	Multiple choice	When should you ask about pay?	At beginning Never **If you get a firm offer** Whenever appropriate

Create questions in left-hand pane.

View questions created in right pane.
[As in Ajuveris]

Office Admin View Other Resources Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

+ Preparing Effective Resumes – Three Styles by Aimah Reiter Edit Delete

+ Navigating a Job Fair by U. Seful Udweiss Edit Delete

- IT firms in the Ottawa Region Edit Delete

A family tree of IT firms in the Ottawa region in the form of a jpeg image.

+ How to Succeed in Interviews by ITO staff Edit Delete

Clicking on resource title opens resource in a new window

Hovering over resource title expands an annotation block

Office Admin Create Other Resources Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training materia
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

Add a Resource

Title:

Annotation:

Upload file

Office Admin Consultants Page

Org name
Navbar

- Home
- Notifications
  - View/edit
  - Create
- Training material
- Evaluation
  - View/edit
  - Create
- Other resources
  - View/edit
  - Create
- Consultants
- Create accounts
  - Office admin
  - Consultant
  - Client
- Reports
  - By event
  - By month
- Account

Logout

+ Consultant 1

+ Consultant 2

- Consultant 3

  + Client 1: Assignments: 4; completed: 3
  + Client 2: Assignments: 4; completed: 2
  - Client 3: Assignments: 3; completed: 3
    1. Orientation: 2 hours; confirmation
    2. Resume clinic: 4 hours; evaluation: 80%
    3. Successful interviews: 1 hour; evaluation: 100%
  + Client 4: Assignments: 3; completed: 0
  + Client 5: Assignments: 4; completed: 4

+ Consultant 4

+ Consultant 5

Hovering over consultant's name displays his/her clients with usage summary. Hovering over client name displays details.

Serving Video Content

The Problem

- Saving video content in a database is a bad idea – high volumes of data degrade database performance;
- Saving video in content in webapp files is also a bad idea – potentially enormous amounts of data must be uploaded in the course of maintenance;
- Saving video content in a Network File Server (NFS) is one option but exposes system files to risks of code injection.
- The Secure Shell File System (SSHFS) is one alternative to NFS but can be cumbersome and slow;
- Saving video content in a Content Delivery Network (CDN) has advantages – content is duplicated across multiple servers and is therefore safe against loss, and distance from servers to clients is minimized – but, unless users are dispersed
- world-wide, costs can become prohibitive;

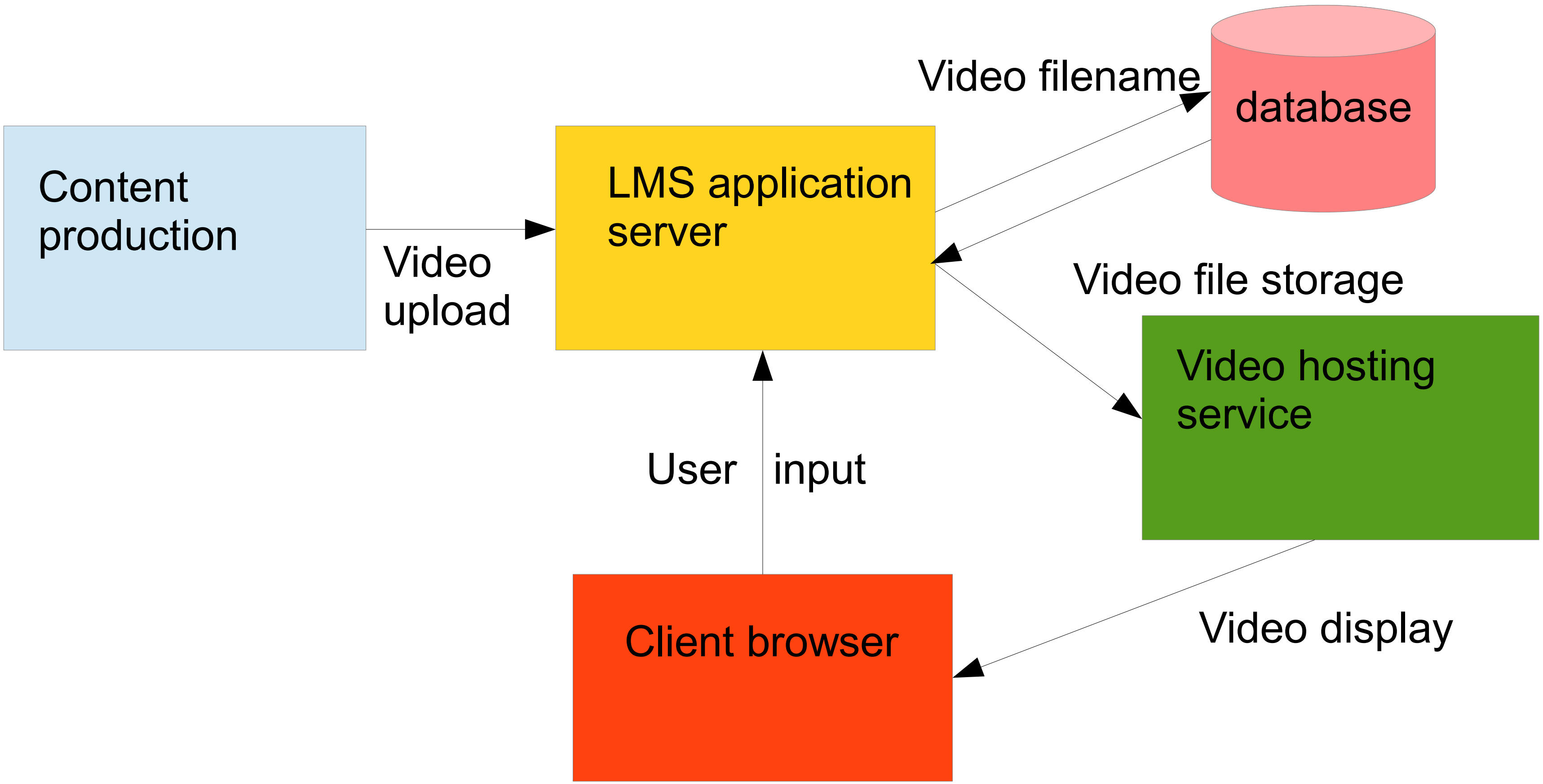
The Solution

A Video Hosting service appears to be the best option:

- YouTube is free and fast but contains advertising and distracting thumbs of other videos and cannot be customized;
- Wistia (https://wistia.com/) appears to be the best option among many alternatives: no ads, no thumbs, customizable, permits pausing video to seek user input, includes analytical tools that can contribute to usage measurement objectives, affordable cost ($100/mo), distributed servers like a CDN at lower cost.

Saving and Serving Up Video Files

Video files will be stored in the video hosting service, with filenames only stored in the database.



Accessibilty: Standards and Best Practices

As of 2014, Ontario provincial law requires that websites for private or non-profit organizations with more than 50 employees and all public-sector organizations apply Web Content Accessibility Guidelines (WCAG) 2.0 Level A. Beginning January 1, 2021, all public websites and web content posted after January 1, 2012 must meet WCAG 2.0 Level AA other than criteria 1.2.4 (live captions) and 1.2.5 (pre-recorded audio descriptions).

Specifics of standards are available at:
https://www.ontario.ca/page/how-make-websites-accessible#section-0
and here:
https://www.w3.org/standards/webdesign/accessibility
https://www.w3.org/WAI/intro/aria.php (Web Access Initiative - Accessible Rich Internet Applications (WAI-ARIA);

Best practices are explained here:
https://www.webaccessibility.com/best_practices.php
http://accessibility.arl.org/standards-best-practices/
http://www.clarissapeterson.com/2012/11/html5-accessibility/

Designing the LMS to meet accessibility standards will require further and continuous study.

Accessibility: Main Points

GUI controls:

- W3C html5 standards compliance is important;
  - use appropriate hierarchy of headers (h1 -h6) to make it easier for the visually impaired to skip through sections;
  - keep content (html) and presentation (css) separate;
  - combine html5 and Accessible Rich Internet Applications (ARIA) techniques where possible (e.g., <header role=”banner”>);
- Simplicity of visual layout helps;
- Images: “alt” text substitutes for all images;
- Mouse/Keyboard: keyboard alternatives to all mouse events (This does not appear to require any software changes. Operating systems can be set to permit the numeric keypad to be used to move the cursor.);
- Form elements: use <label> and <input> tags to enable screen-reader output for the visually impaired;
- Good source: http://www.clarissapeterson.com/2012/11/html5-accessibility/

Content:

- Audio: text alternatives for all audio content;
- Video: subtitles for the hearing impaired, text alternatives for the visually impaired.

Responsive Page Design

- **Page design must be responsive:**

Today's youth makes extensive, virtually exclusive use of mobile devices, smart phones and tablets, in lieu of computers. Especially given YSB's focus on youth services, it is essential that our LMS application be designed to display correctly and usefully on mobile devices. This means detecting minwidth and maxwidth attributes of browsers to detect screen size and modifying page styling to match smaller screen sizes.

- **Bootstrap and other page design frameworks may be helpful**

We should explore using the Bootstrap framework or other frameworks to facilitate responsive page design.

- **Responsive page design must not conflict with accessibility needs**

It will be extremely important to ensure that styling used to create response page designs not conflict with styling requirements need to meet Ontario accessibility standards. Accessibility for the visually impaired imposes certain criteria on the use of html divs et al that permit the use of assistive technology (AT – principally screen readers which generate audible representations of content) to navigate conveniently as well as to present content.