

Developing Offline Web Application

Kanda Runapongsa Saikaew

(krunapon@kku.ac.th)

Art Nanakorn

Thana Pitisuwannarat

Computer Engineering

Khon Kaen University, Thailand

Agenda

- Motivation
- Offline web application samples and tools
- Web application implementation
- Experimental result
- Conclusion

Motivation

- Software is increasingly available in the form of web application
- Sometimes web application users are seriously affected by disconnected Internet connection
- Developing web application that can be accessed both online and offline is thus necessary

The Web Will Be Everywhere

- Mobile devices (iPhone, PDA, Palm)
- Desktop and laptop
- Widgets
- TV
- The browser will be fast
 - Google Chrome, Firefox, Internet Explorer

Why Offline?

- Reliability: sometimes we really need to get data at that moment
- Performance: local acceleration
- Convenience: Not having to remember where we store data (just search)
- Usually human beings are offline more than online!

Sample Web Applications with Gears

- YouTube: upload large size videos
- Wordpress: speed up every page load and enable users to blog faster
- Google Reader: allow users to access the RSS feeds when they are offline
- Gmail: enable users to read, reply, and search emails when they are offline

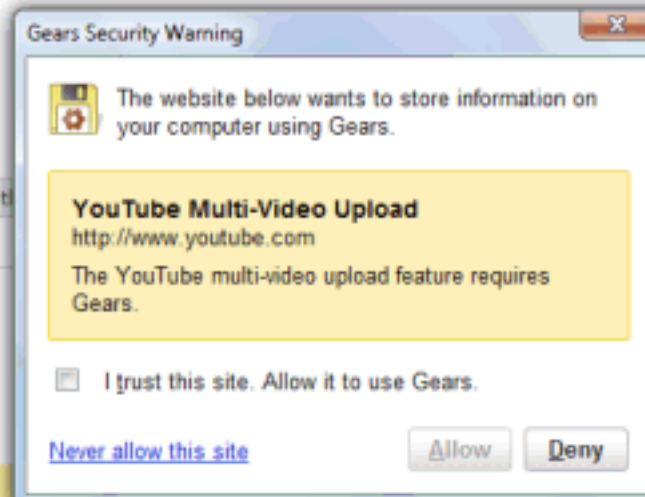
YouTube Uploader Powered by Gears

Upload each video up to 1 GB
without installing a dedicated software

Multi-Video Upload

Each video can be up to 10 minutes in length and up to 1GB in size. These videos will be available in [My Videos](#) after they have finished processing. It may take 30 minutes or more for extremely large files to appear on your My Videos page.
Go back to [Single File Upload](#).

Filename	Title	Options	Status
		---	No videos added



Do not upload any TV shows, music videos, music concerts, or commercials without permission unless they consist entirely of content you created yourself. Please refer to our [Copyright Tips](#) page for some guidelines and links to help you determine whether your video infringes someone else's copyright.

By clicking "Upload Video," you are representing that this video does not violate YouTube's [Terms of Use](#) and that you own all copyrights in this video or have express permission from all copyright owners to upload it. Remember that your use of this uploader is also governed by our [Terms of Use](#).

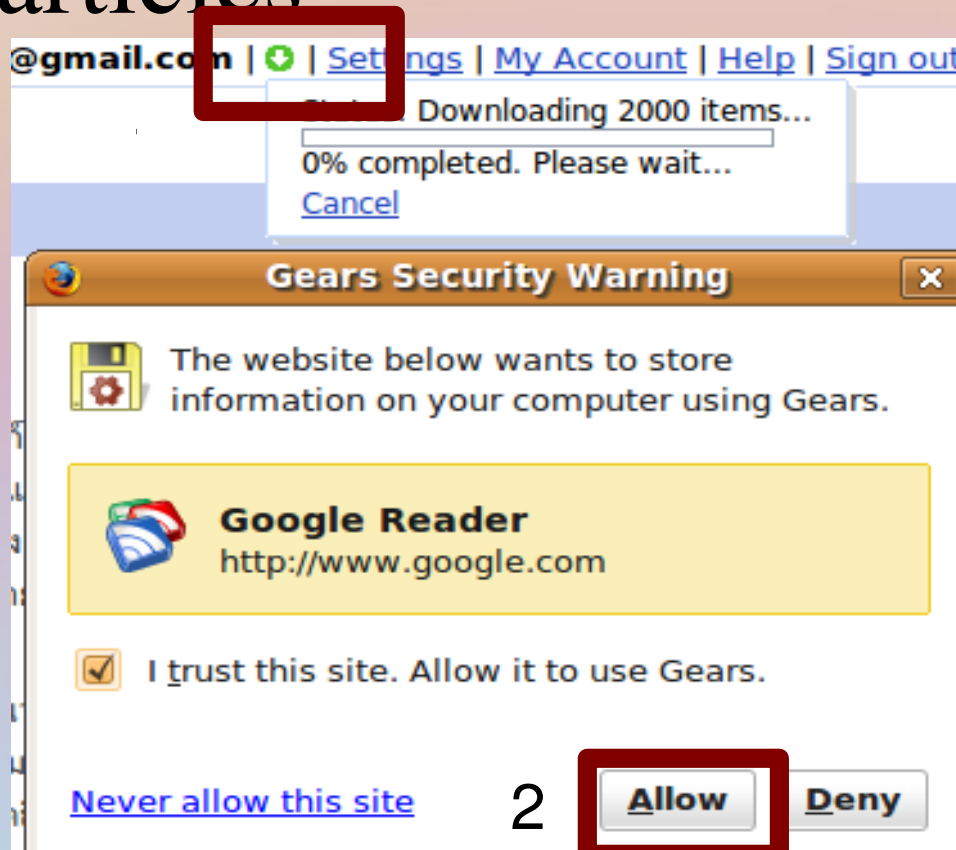
Speed up WordPress with Gears

- With Gears enabled, most of WordPress's images, scripts and CSS files will be stored locally on a user's computer

The screenshot shows the WordPress admin dashboard. At the top, there is a navigation bar with the WordPress logo, the text 'Wordpress' with a link to 'Visit site', a 'New Post' button, and user information 'Howdy, admin | Turbo | Log Out'. Below this is a sidebar with menu items: Dashboard, Posts, Media, Links, Pages, Comments, and Appearance. The main content area is titled 'Tools' and features a notification for 'Turbo: Speed up WordPress'. The notification text reads: 'WordPress now has support for Gears, which adds new features to your web browser. [More information...](#) After you install and enable Gears, most of WordPress' images, scripts, and CSS files will be stored locally on your computer. This speeds up page load time. **Don't install on a public or shared computer.** Below the notification is an 'Install Now' button.

Read Feeds When You Aren't Online

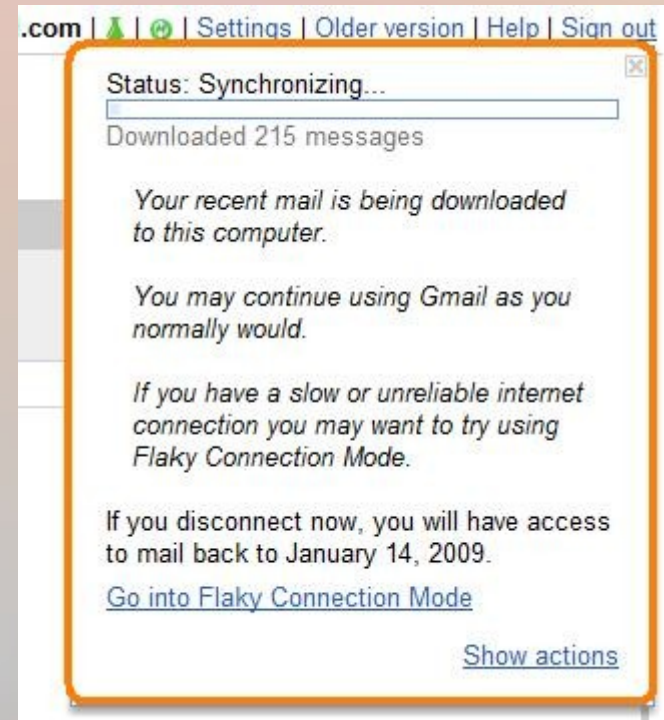
- Click the green icon to download the most recent articles



Gmail with Offline Enabled Setting

- Install offline access

- Synchronizing



Offline Web Application Tools

- Microsoft silverlight
 - Need to know .NET programming
- Adobe Integrated Runtime (AIR)
 - Must know Flash and AIR platform
- Gears
 - Need to know only javascript

Gears

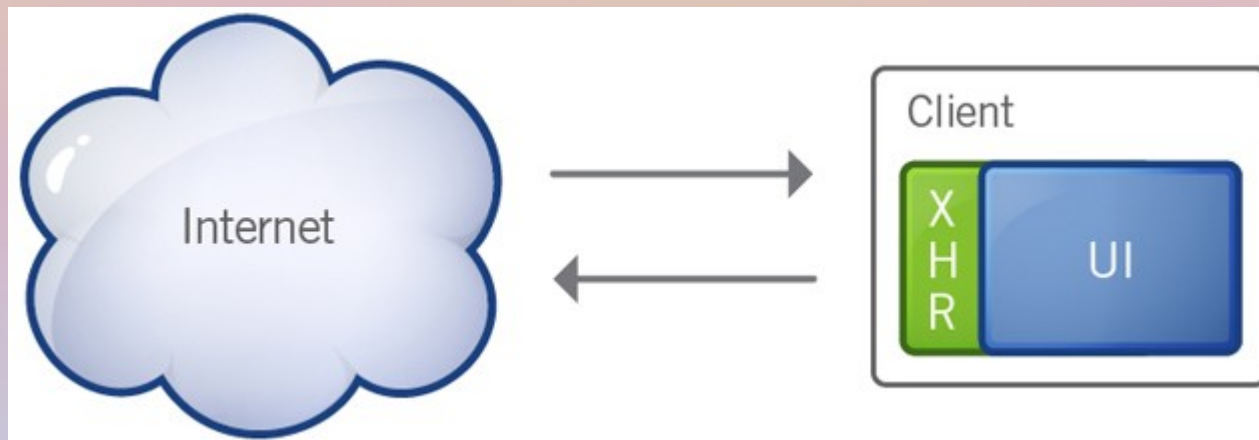
- Open source browser extension: enables more powerful web applications
 - Let web applications interact naturally with your desktop
 - Store data locally in a fully-searchable database
 - Run JavaScript in the background to improve performance

The Web with AJAX and Gears

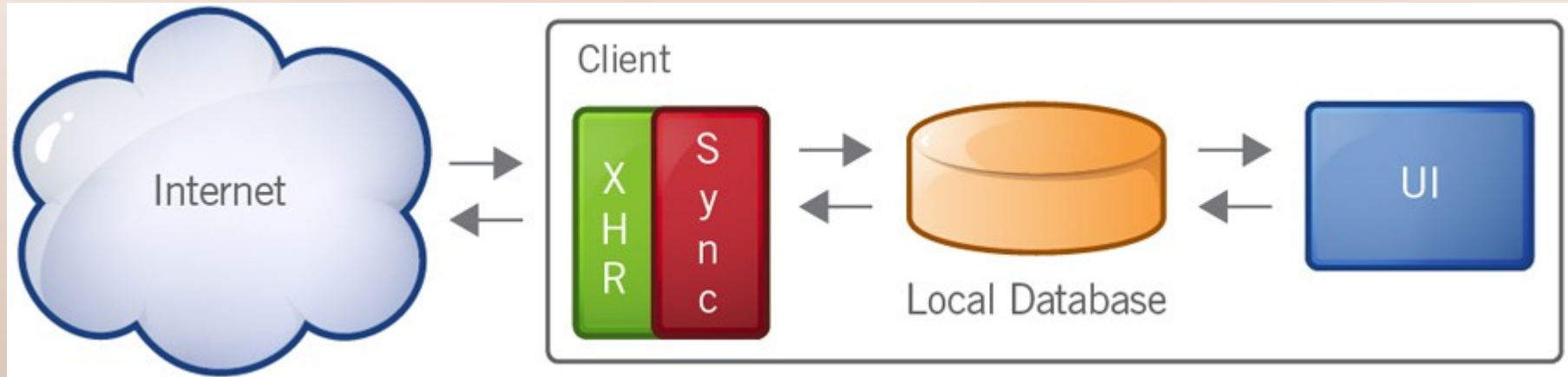
- AJAX and Gears in the web environment and native environment



AJAX Architecture



Offline Architecture



- Read and write using local store
- Changes are queued for later synchronization
- Server communication is completely decoupled from UI actions, happens periodically whenever there is a connection

Main Modules in Gears API

- LocalServer

- Cache and serve application resources (HTML, JavaScript, Images, etc.) locally

- Database

- Store data locally in a fully-searchable relational database

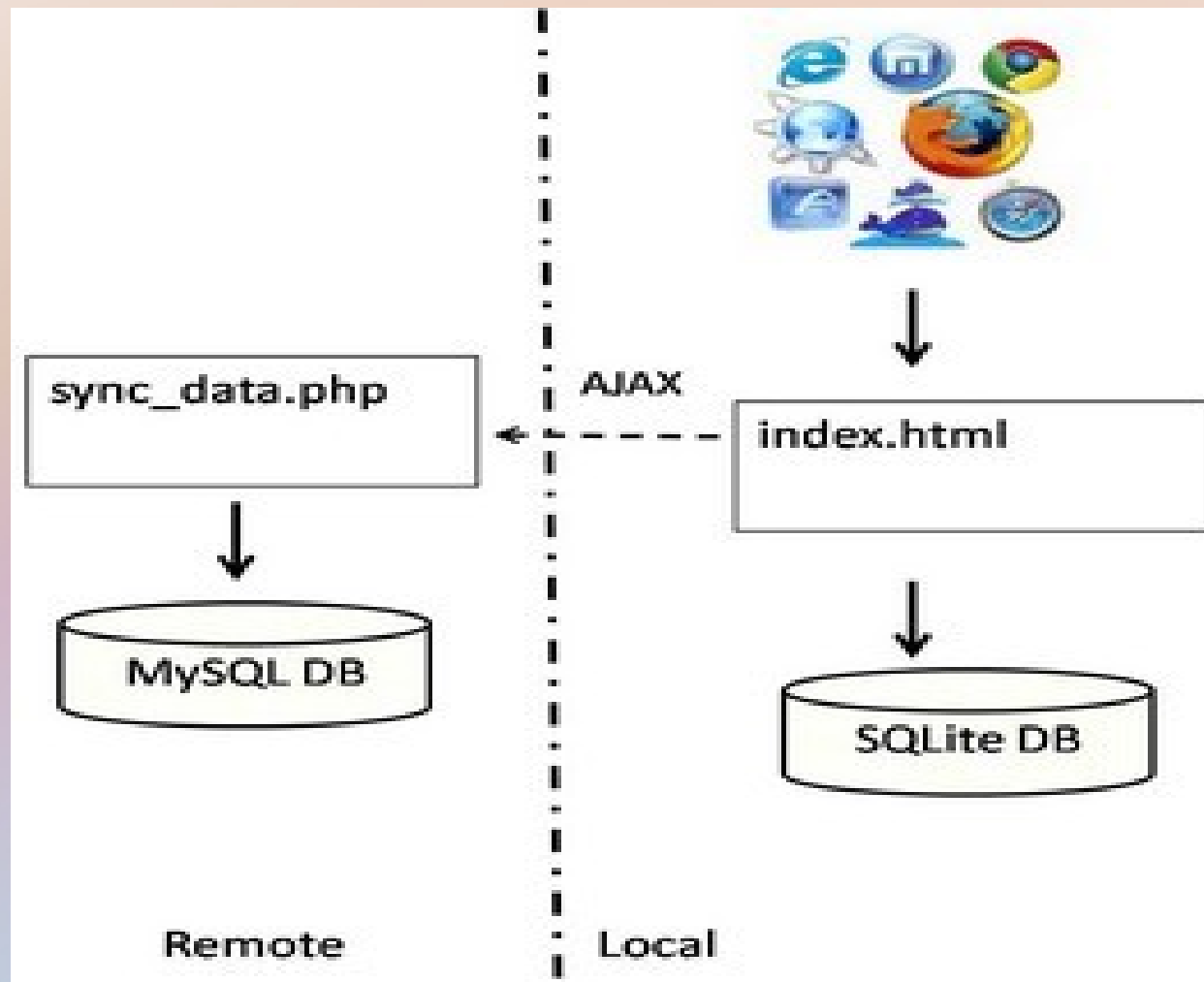
- WorkerPool

- Make your web applications more responsive by performing resource-intensive operations asynchronously

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Web Application Architecture



Web Application Interface

- Registration form and registered users

Enter your information:

Firstname:

Lastname:

Year:

Phone:

Email:

Registered users are:

(1) Art Nanakorn 5 0845101[REDACTED]@gmail.com

(2) Thana Pitisuwannarat 4 089-4174[REDACTED]@gmail.com

Main Web Development Procedure

- Check whether Gears has been installed
- Store data in a local database
- Store data in a server database
- Synchronize data between server and local databases

Check whether Gears installed

- Download and use file gears_init.js

```
<script src="gears_init.js"></script>
```

```
<script>
```

```
if (!window.google || !google.gears) {
```

```
    location.href= "http://gears.google.com/?action=install&
```

```
message=<your welcome message>" +
```

```
    "&return=<your website url>";
```

```
}
```

```
</script>
```

Store Data in a Local Database (SQLite)

- try {
 db = google.gears.factory.create('beta.database');
 if (db) {
 db.open('db');
 db.execute('create table if not exists users' +
 ' (firstname varchar(255), ...'
 }
} catch (ex) {
 alert(ex.message);
}

Store Data in a Server Database (MySQL)

```
<?php
// connect and select database
mysql_select_db("registerdb")
or die(mysql_error());
if ($method == "access") {
// use SQL statements to retrieve data
} else if ($method == "update") {
// use SQL statements to insert data
}
```



Copy Data from Server DB to Local DB

```
var sync_script = 'http://host/directory/sync_data.php';  
var request = google.gears.factory.create('beta.httprequest');  
request.open('POST', sync_script);  
request.setRequestHeader("Content-type", "application/x-www-  
form-urlencoded");  
request.onreadystatechange = function() {  
if (request.readyState == 4) {  
// insert data received from server db to local db  
}  
};  
request.send(params);
```


Copy Data from Local DB to Server DB

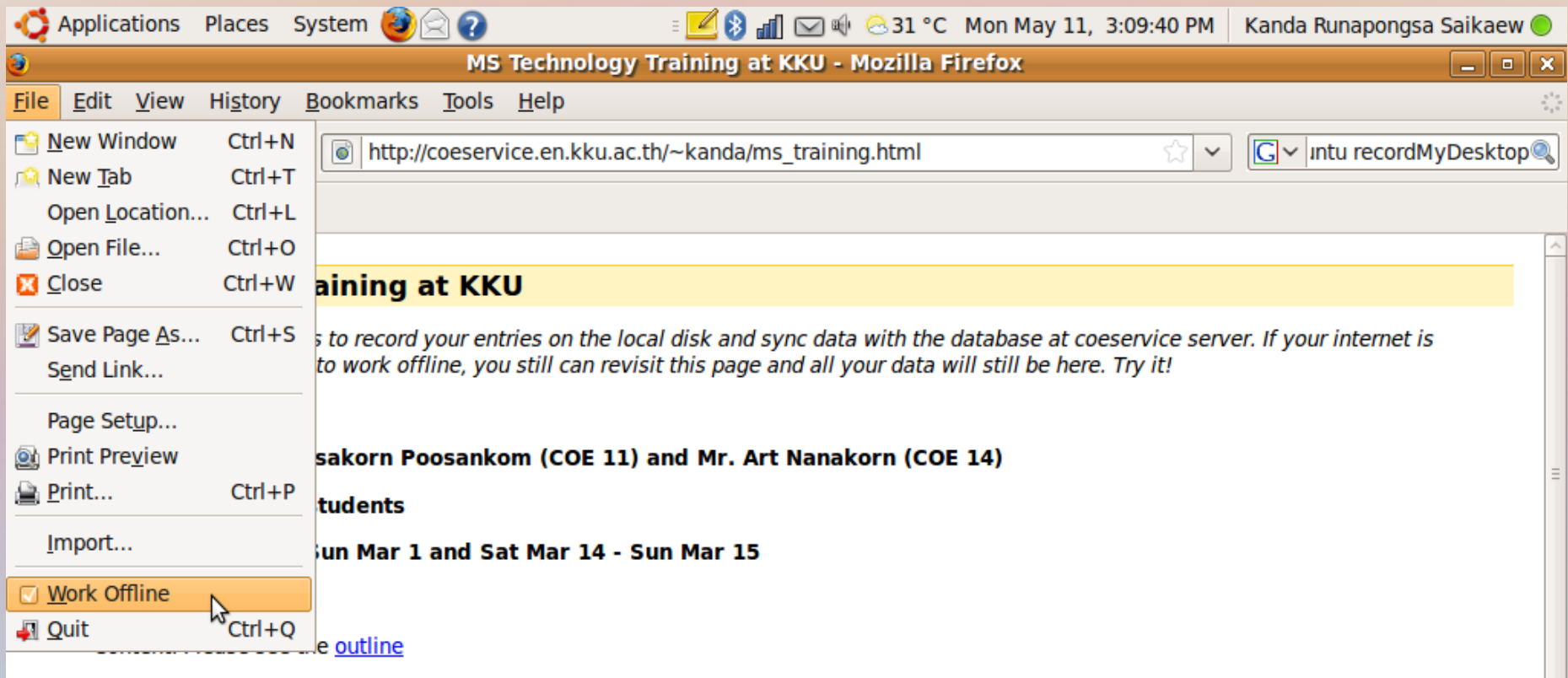
```
var request =  
google.gears.factory.create('beta.httprequest');  
var params="method=update&f="+firstnames[index];  
...  
request.open('POST', sync_script);  
request.setRequestHeader("Content-  
type", "application/x-www-form-urlencoded");  
request.send(params);
```

Experimental Result

- Check whether the web application can work offline
 - User can access and fill out the form
- Check whether the application can synchronize data
 - Multiple users view the same result

Check Offline Web App Ability (1/3)

- Select Work Offline at Browser Menu



Check Offline Web App Ability (2/3)

- Use the Web from the browser with offline mode

• Note: Please register only if you can attend. If you want to attend, you should register **2008**

Enter your information:

Firstname:

Lastname:

Year:

Phone:

Email:

Check Offline Web App Ability (3/3)

The screenshot shows a Mozilla Firefox browser window with the title 'MS Technology Training at KKU - Mozilla Firefox'. The address bar contains the URL 'http://coeservice.en.kku.ac.th/~kanda/ms_training.html'. The page content includes a list of instructions, a registration form, and a list of registered users.

- Content: Please see the [outline](#)
- Note: Please register only if you can attend. If you want to attend, you should register to **2008**

Enter your information:

Firstname:

Lastname:

Year:

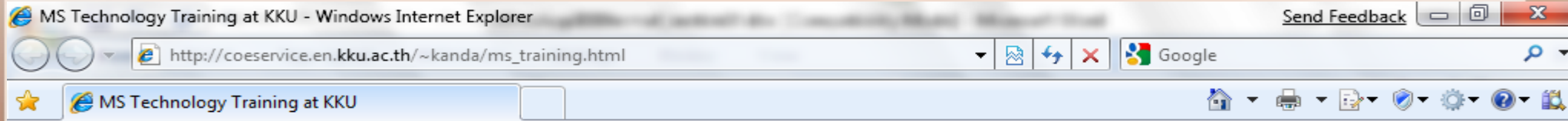
Phone:

Email:

Registered users are:

(1) Chanapat Saikaew 1 089-111-2222 chanapat@gmail.com
(2) Art Nanakorn 5 [redacted]@gmail.com
(3) Thana Pitsuwannarat 4 [redacted]@gmail.com
(4) Suchart jumpeeklang 4 083-1513574 en42chart@gmail.com

Check Synchronization: User 1



MS Technology Training at KKU

This page uses Google Gears to record your entries on the local disk and sync data with the database at coeservice server. If your internet is disconnected or you choose to work offline, you still can revisit this page and all your data will still be here. Try it!

The training information

- Instructors: **Mr. Pongsakorn Poosankom (COE 11) and Mr. Art Nanakorn (COE 14)**
- Audience: **COE KKU students**
- Dates: **Sat Feb 28 - Sun Mar 1 and Sat Mar 14 - Sun Mar 15**
- Place: **EN 4210**
- Content: Please see the [outline](#)
- Note: Please register only if you can attend. If you want to attend, you should register to reserve your seat. **Please register by Feb 20, 2008**

Enter your information:

Firstname:

Lastname:

Year:

Phone:

Email:

Registered users are:

- (1) Art Nanakorn 5 0845101109 nanakorn.a@gmail.com
- (2) Korkeat Wannapat 3 085-7401471 khasathan@gmail.com
- (3) Pongsak Sripanya 3 0862211188 to_pongsak@hotmail.com
- (4) Somchai Tonngam 3 089-4171974 banate_s@hotmail.com
- (5) Suchart jumpeeklang 4 083-1513574 en42chart@gmail.com
- (6) Thana Pitisuwannarat 4 089-4174341 t.pitisuwannarat@gmail.com

Check Synchronization: User 2

MS Technology Training at KKU - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coeservice.en.kku.ac.th/~kanda/ms_training.html

MS Technology Training at KKU

This page uses Google Gears to record your entries on the local disk and sync data with the database at coeservice server. If your internet is disconnected or you choose to work offline, you still can revisit this page and all your data will still be here. Try it!

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- (4) Somchai Tonngam 3 089-4171974 banate_s@hotmail.com
- (5) Suchart jumpeeklang 4 083-1513574 en42chart@gmail.com
- (6) Art Nanakorn 5 0845101109 nanakorn.a@gmail.com

Done

Windows Taskbar: <kanda/> ... MS Techno... Windows Li... COE2008-1... Logbook Project - sft... Works Ps Adobe Phot... EN 1:28 AM

Conclusion

- Web applications have been integrated into our daily life
- Need to make web application offline
 - To access our data at any time
 - To speed up the web application
- We have developed offline web application using Gears

References

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