

# MUPE – Multi-User Publishing Environment

Mobile Multi-User Context-Aware Application Development

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[www.mupe.net](http://www.mupe.net)  
[www.mupedev.org](http://www.mupedev.org)

# MUPE – Multi-User Publishing Environment

MUPE is an application platform for rapid development of (mobile) multi-user context-aware applications and services.

All parts of MUPE are written in Java (J2ME in clients)

Everything is available under the Nokia Open Source license 1.0.

Scripted client UI script language – one client for all applications (One install on mobile phone gives access to many applications)

Context information is added to the system from the network, or from each user client.

# Key Features

Optimised for the wireless network

- Minimized network data traffic (data compression)

- Optimised graphics (download at connection)

- Dynamic content (objects in the client can be updated – less traffic)

MUPE server contains a simple virtual world, that is extended for each application. Only server side programming needed.

Easy scripted access to phone features (camera, sound, video, BT IDs, ...)

Public display support

# Why Open Source?

Context-awareness has been a research topic for over a decade – yet widely used applications are scarce.

Context-awareness and multi-user support are complex tasks – they can easily take the majority of development resources in a small project.

With MUPE, it is possible to create context-aware multi-user applications cheap and quick on a mobile phone.

Open source gives us the possibility to create new applications together with research partners.

# **Games & Applications made with MUPE**

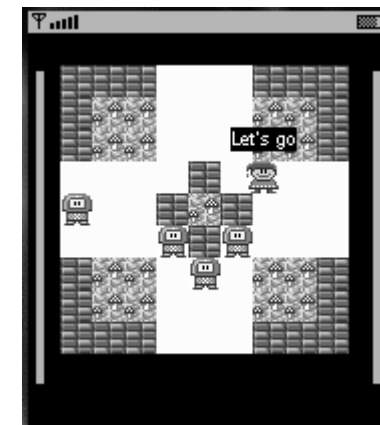
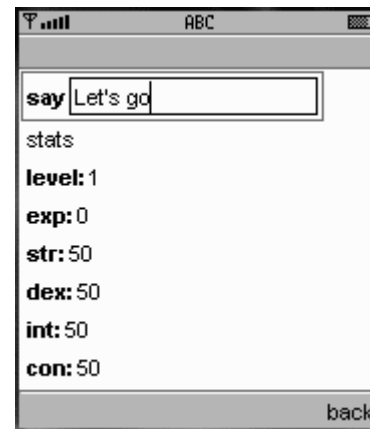
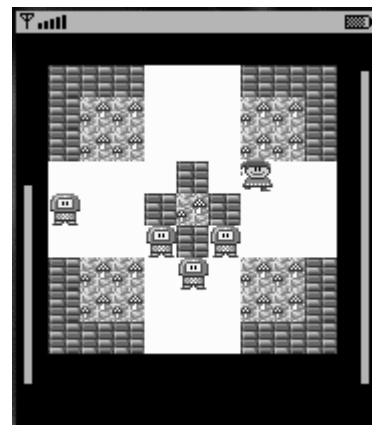
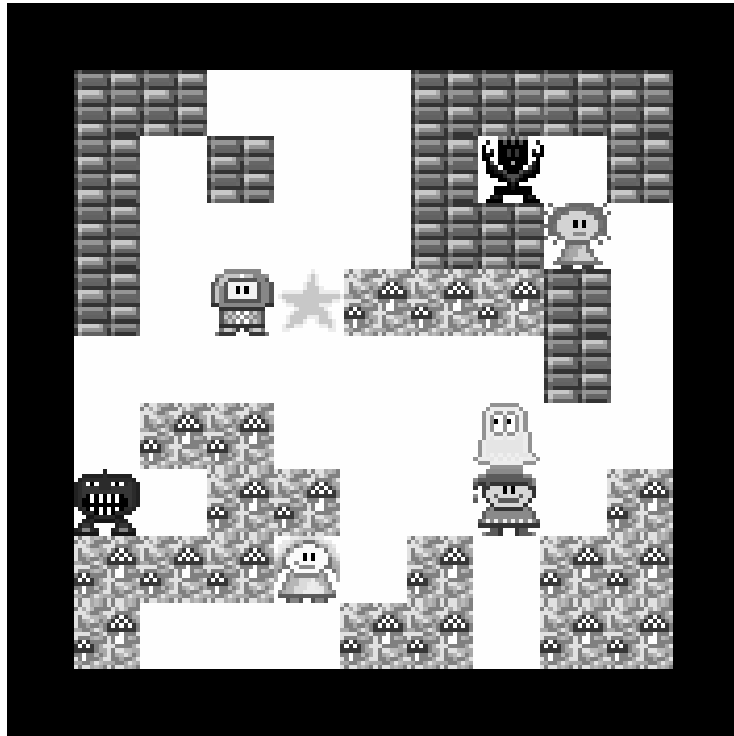
# MUPE Dungeon

A multiplayer dungeon exploration game

# of players: not limited

Actions: asynchronous

Session length: any



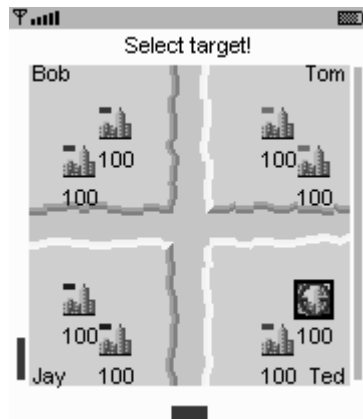
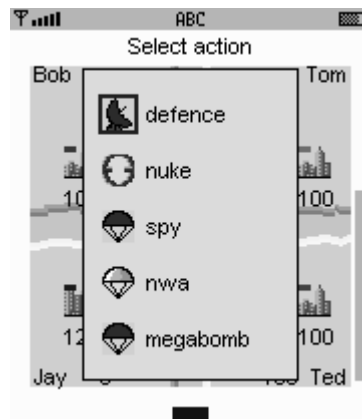
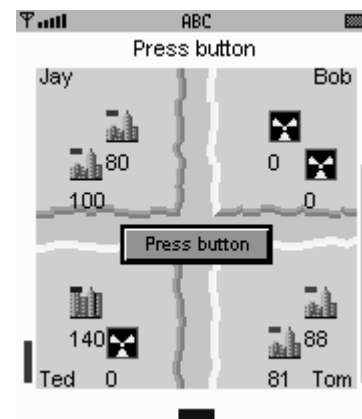
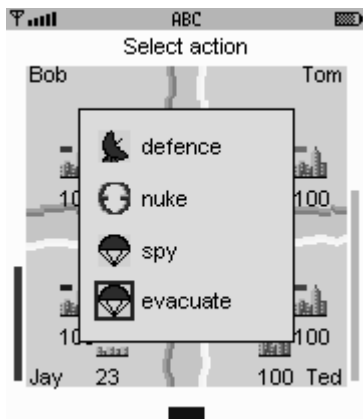
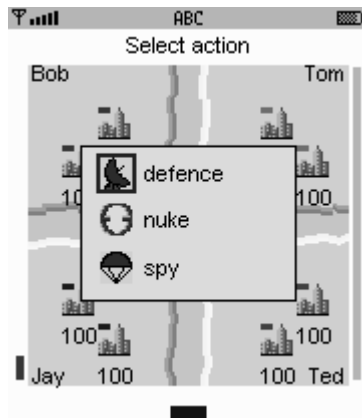
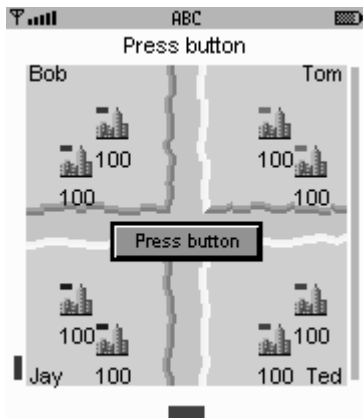
# FirstStrike

4 player strategy game

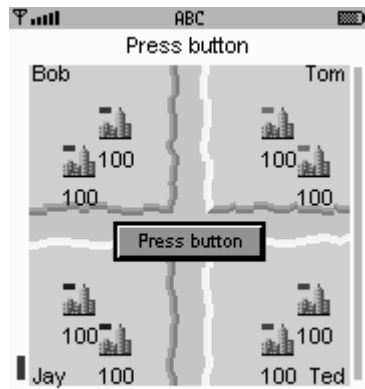
# of players: 4 in a battle

Actions: simultaneous turn-taking

Session length: approximately 5 minutes

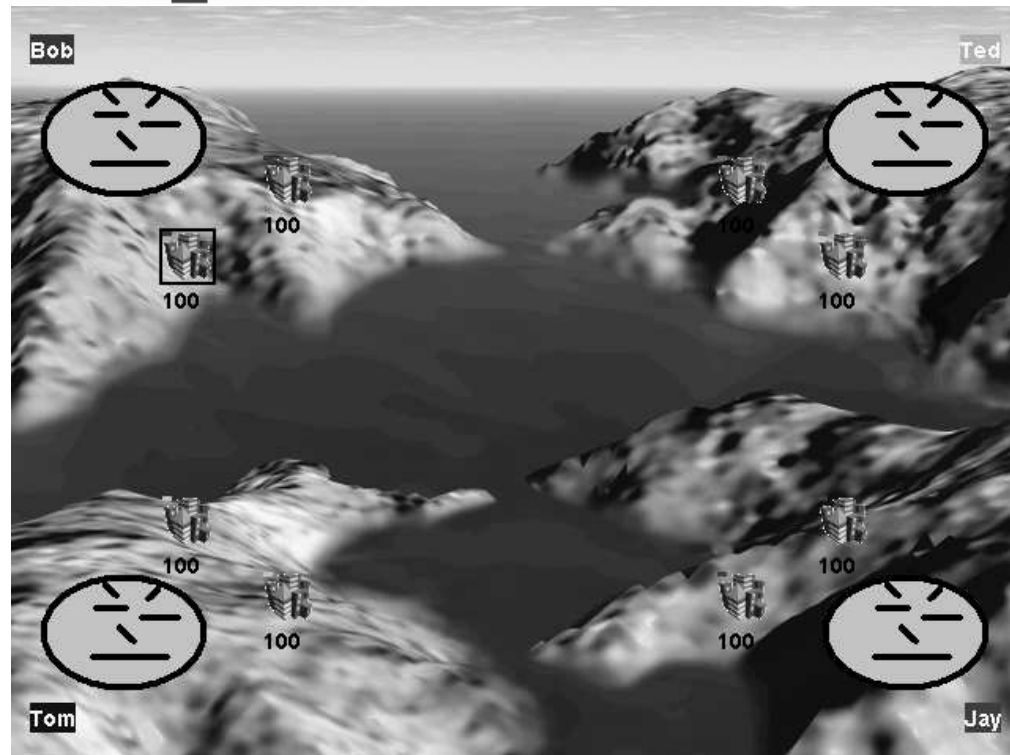


# FirstStrike with a public display



Information on public display changes the tactics slightly.

The public display gets the players attention away from their private displays – more social interaction.



Player photos were fun, and made target identification easier.

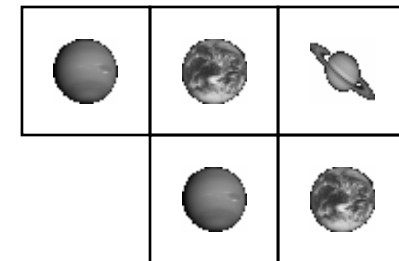
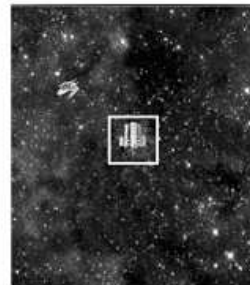
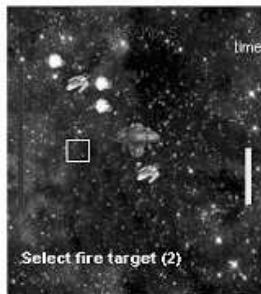
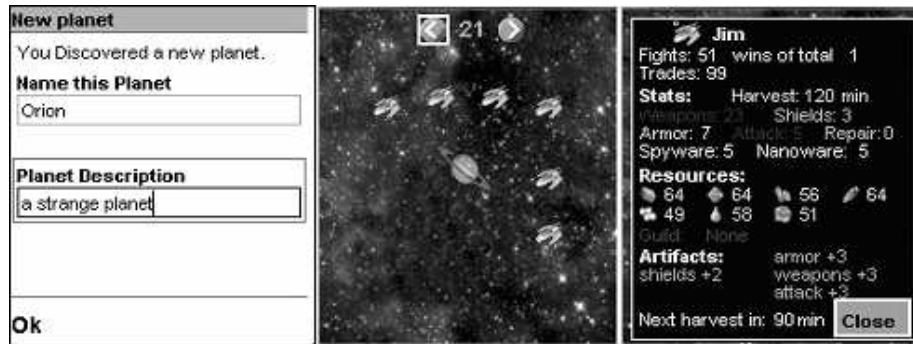
# Constellations

Location-based exploration game

# of players: 8 in a player battle, 20 in a Deity battle, any in exploration

Actions: Asynchronous, simultaneous turn-taking in battle

Session length: any



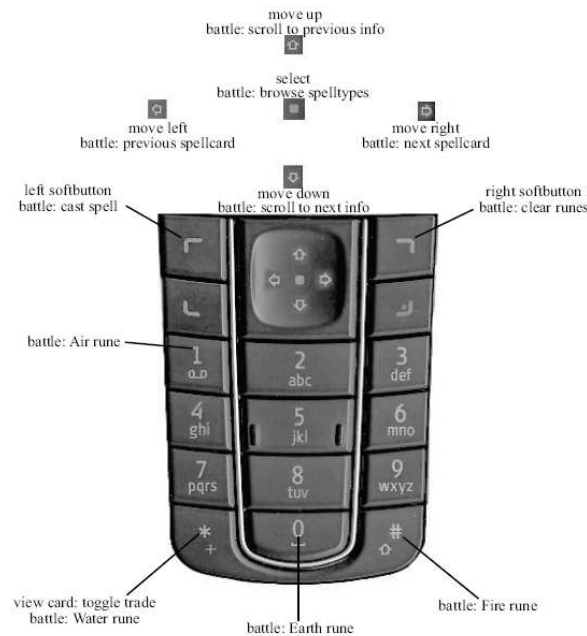
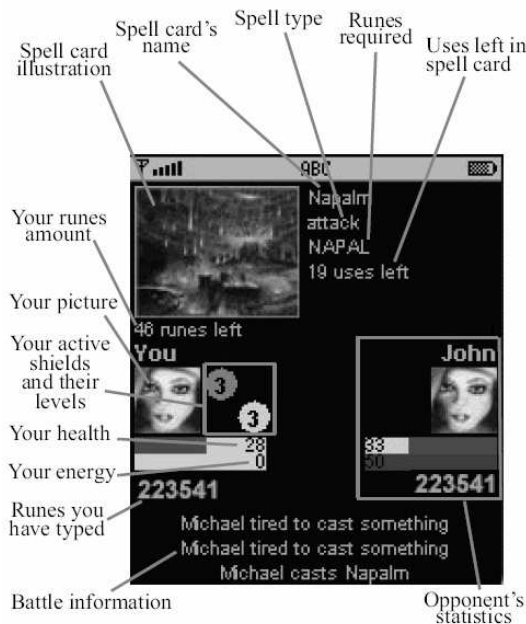
# Ancient Runes

A collectible card game

# of players: 2 in battle, any number of battles

Actions: As fast as can type

Session length: ?



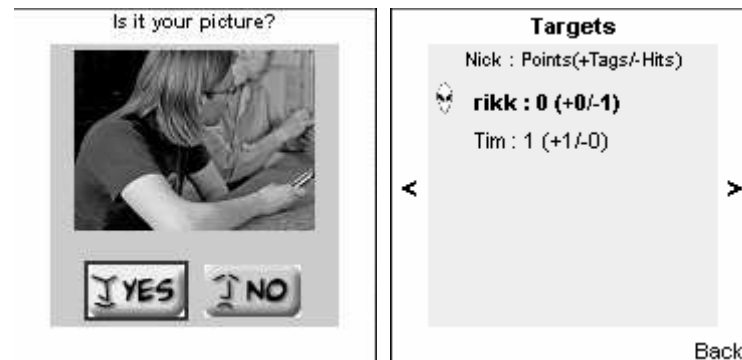
# Assassin

A 1st person camera shooter

# of players: any

Actions: Asynchronous

Session length: 1 minute



# MiniGameServer

Mobile multiplayer micro games

# of players: 8 in a session, any number of sessions

Actions: Simultaneous micro games

Session length: ~1 minute / 5 games



UTA&NRC

# Mobile Groupware



Mobile media co-creation.

Every user of the system can take photos, record sounds, and write notes into the system.

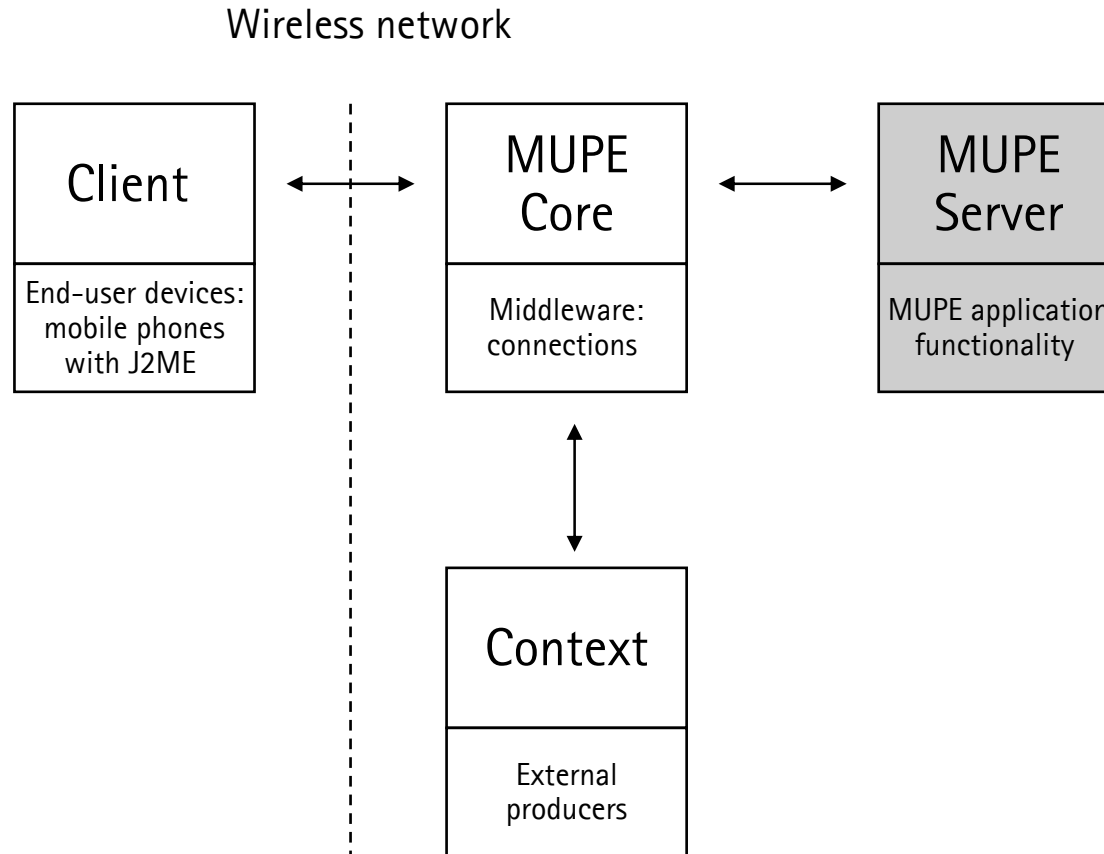
All data is accessible with phones and a web interface.



# How MUPE works?

Java & XML

# MUPE Application Platform Overview



Only the server needs to be changed in typical projects

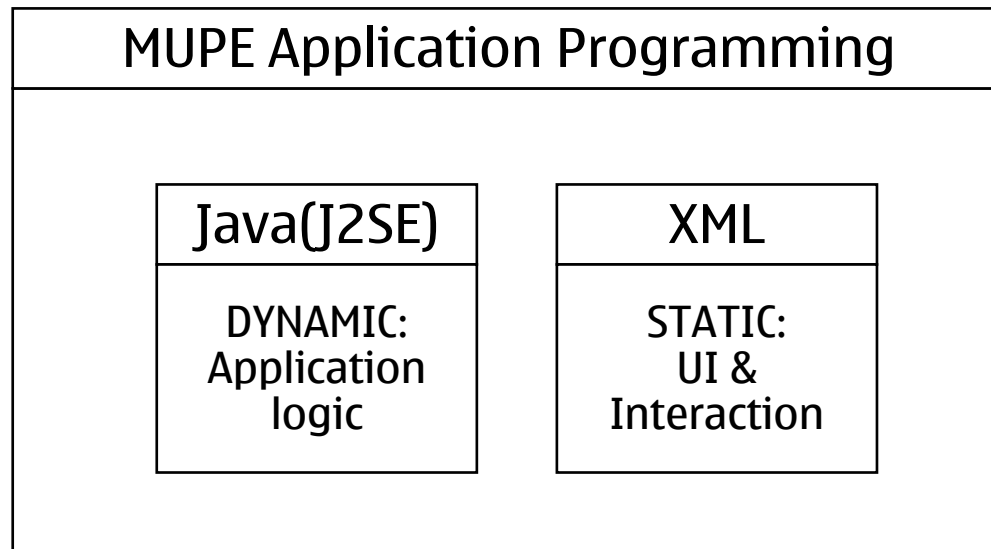
# Server: Static/Dynamic separated

Clients make method calls to the server objects  
(or receives PUSH message)

Server returns a valid UI script

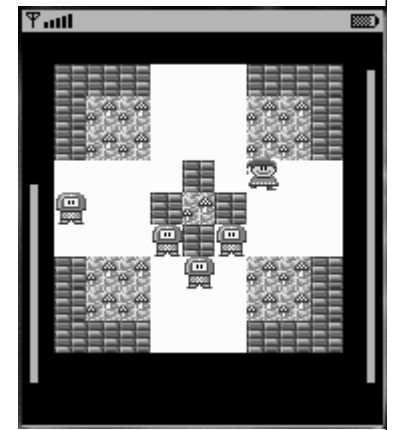
UIs can be created with XML – no need for programming/compilation

Application logic – Java (J2SE) programming



# Example: Tilemap

```
<tilemap ui='game_canvas' id='map' x='16' y='16'  
  rows='9' columns='9' tilewidth='16' tileheight='16'  
  bgcolor='white' opaque='true'  
  <i_addtile resource='res_tile' />  
  <i_addtile resource='res_forest' />  
  
  <i_row index='0' data='0,0,0,_,_,_,0,0,0' />  
  <i_row index='1' data='0,1,1,_,_,_,1,1,0' />  
  <i_row index='2' data='0,1,1,_,_,_,1,1,0' />  
  <i_row index='3' data='_,_,_,_,0,_,_,_,_' />  
  <i_row index='4' data='_,_,_,0,1,0,_,_,_' />  
  <i_row index='5' data='_,_,_,_,0,_,_,_,_' />  
  <i_row index='6' data='0,1,1,_,_,_,1,1,0' />  
  <i_row index='7' data='0,1,1,_,_,_,1,1,0' />  
  <i_row index='8' data='0,0,0,_,_,_,0,0,0' />  
</tilemap>
```



# **Rapid Development of Multiplayer games**

How rapid?

# Multiplayer location based games in 24 hours

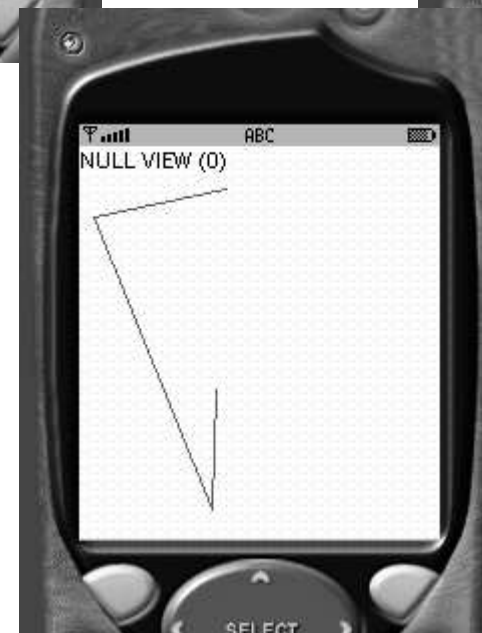
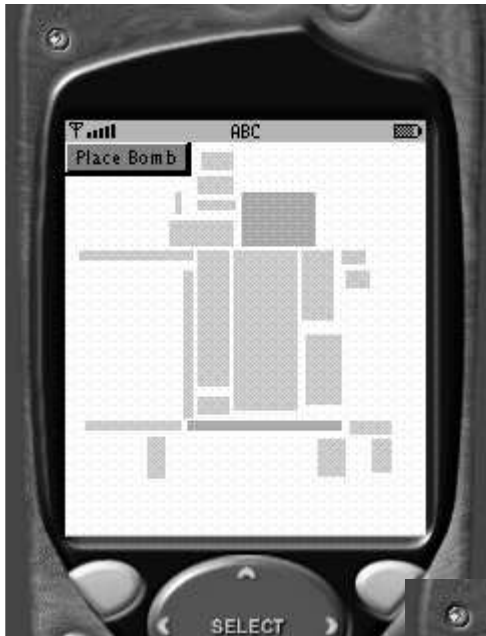
Arrangements: Location producers for MUPE

Session:

1.5 hours of teaching  
coding and fun  
presentation of games



# 5 Finished games



# Multiplayer microgames in 2 hours

1 hour design, 1 hour implementation of micro games

Three groups, each group contained one veteran MUPE developer,

1<sup>st</sup> hour design with all

2<sup>nd</sup> hour implementation & graphic design

→ 6 finished games, that are now a part of the MiniGameServer

# Conclusions

# Conclusions

It is very quick to create a multi-user application or a multiplayer game with MUPE

New technologies of mobile phones are easy to use:

Camera, Microphone, Bluetooth, etc. are in many phones – MUPE creates a plug-in for each new technology in the phone.

A single server side context producer serves every single MUPE application – if someone has done it you can use it.

MUPE core is in two jar packages – it is easy to upgrade to a newer version of MUPE and get all the new features that come with it.

# Upcoming

What's next?

# A large platform development project

NRC, HIIT, LUT, TUT and VTT will start a large TEKES funded development project in 2006.

The plan is to create:

**A lot of applications**

development tools

client side context awareness

server side context awareness

All will be open source

# Thank you

Questions:

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Downloads:

[www.mupe.net](http://www.mupe.net)