

MUPE – Multi-User Publishing Environment

Mobile Multi-User Context-Aware Application Development

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www.mupe.net
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

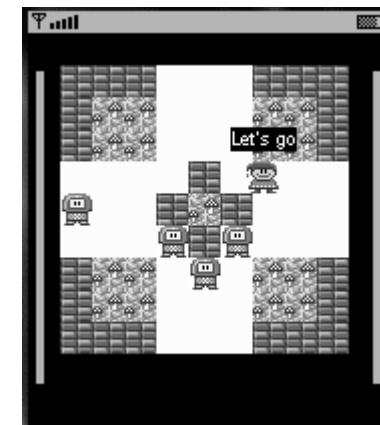
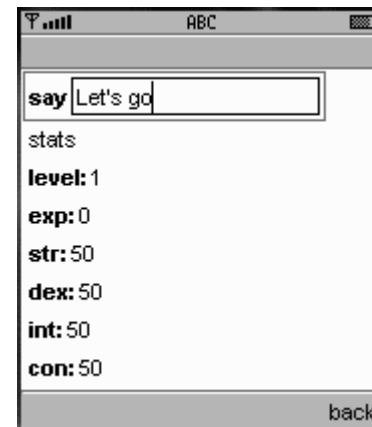
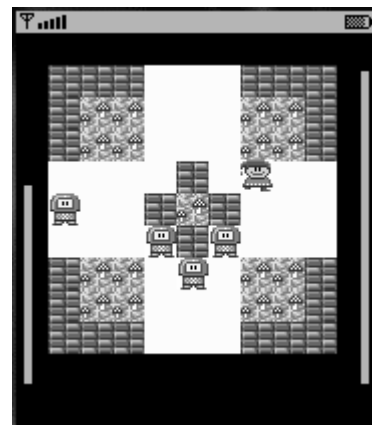
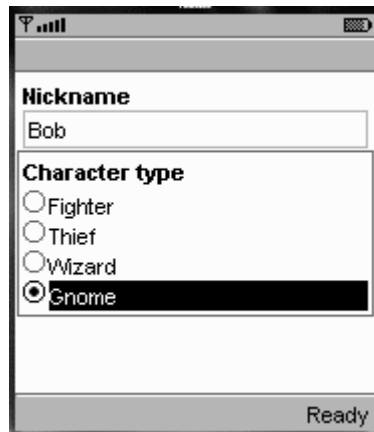
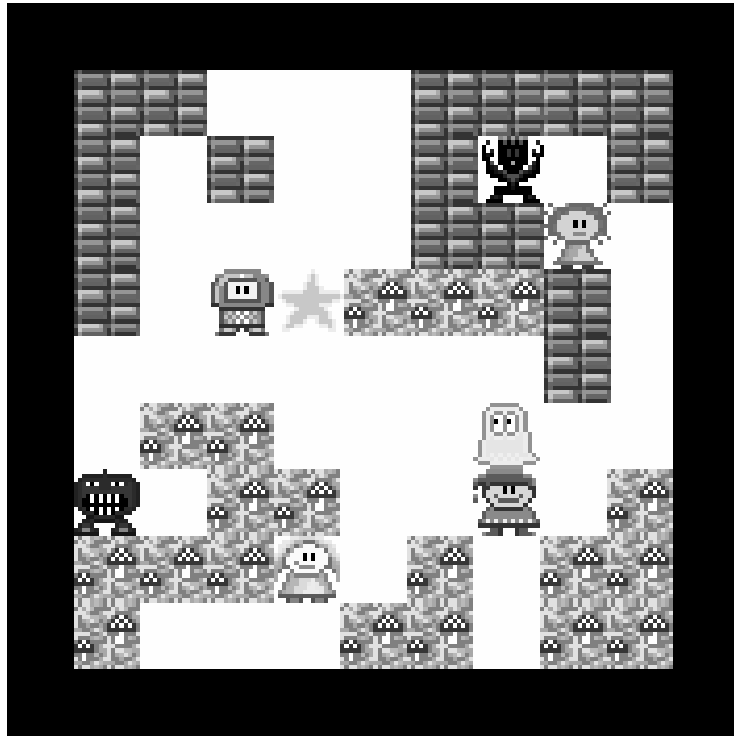
MUPE Dungeon

A multiplayer dungeon exploration game

of players: not limited

Actions: asynchronous

Session length: any



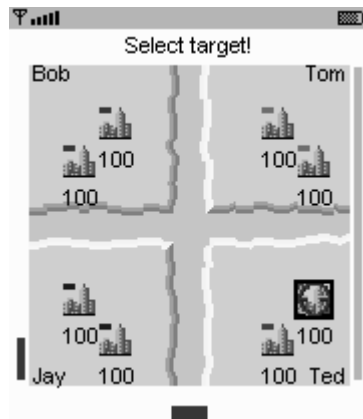
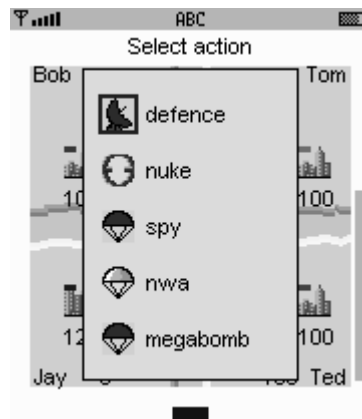
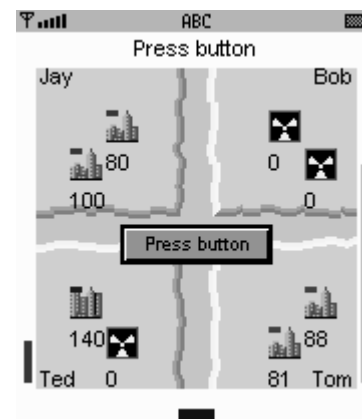
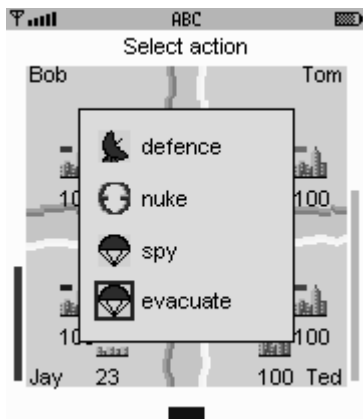
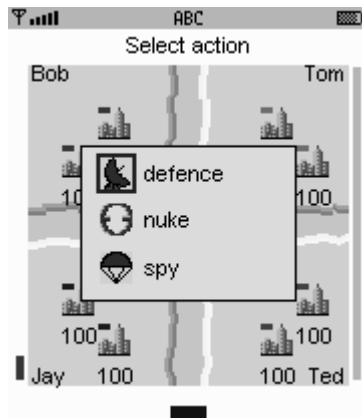
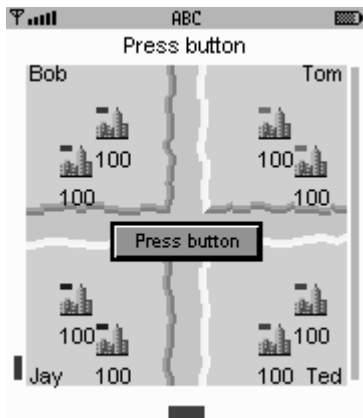
FirstStrike

4 player strategy game

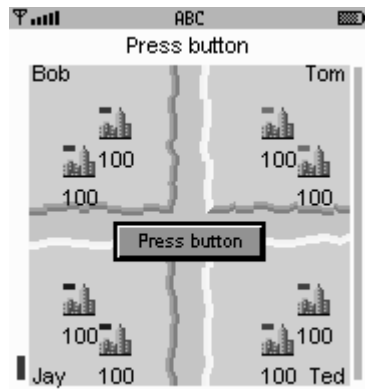
of players: 4 in a battle

Actions: simultaneous turn-taking

Session length: approximately 5 minutes

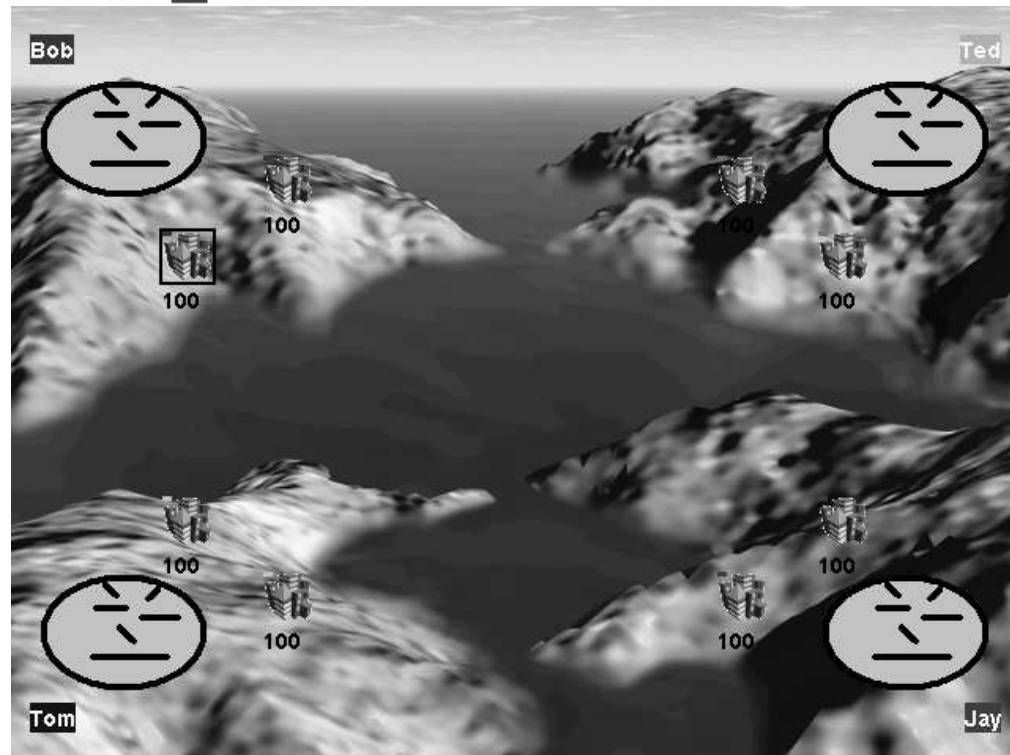


FirstStrike with a public display



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.

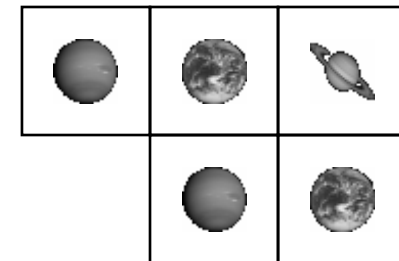
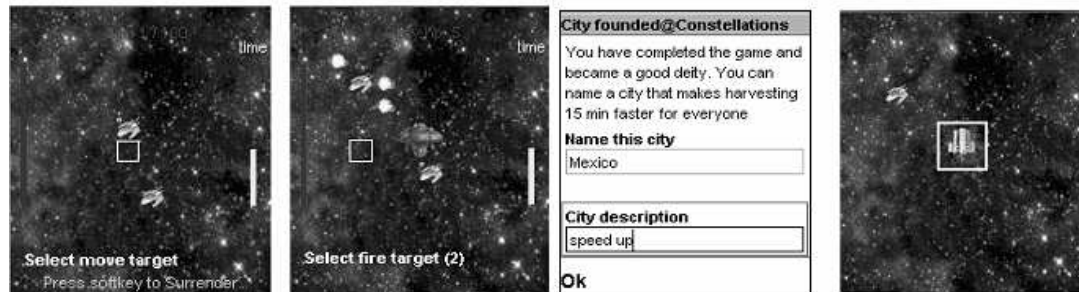
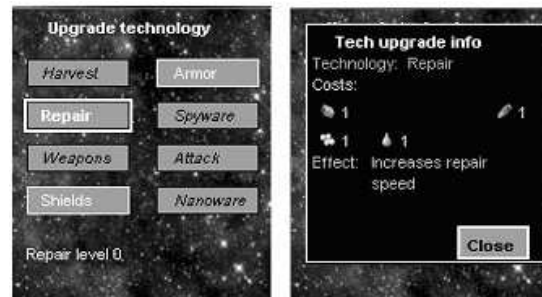
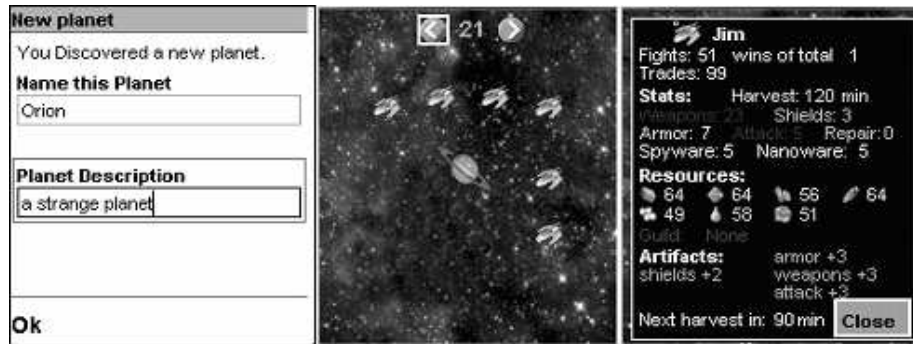
Constellations

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



TUT&NRC

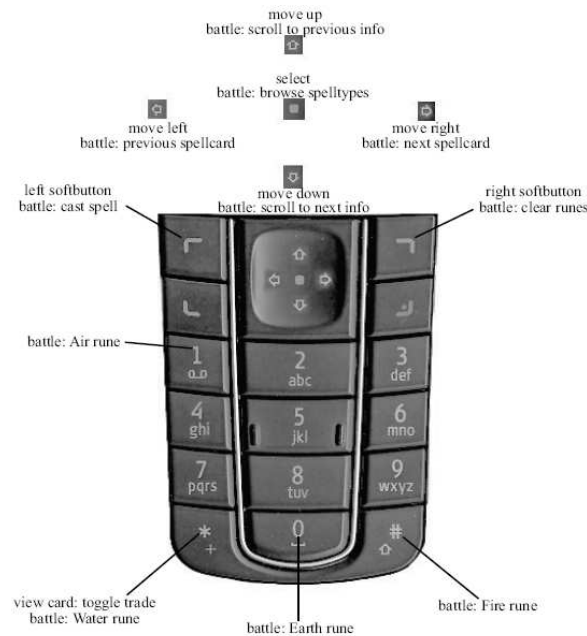
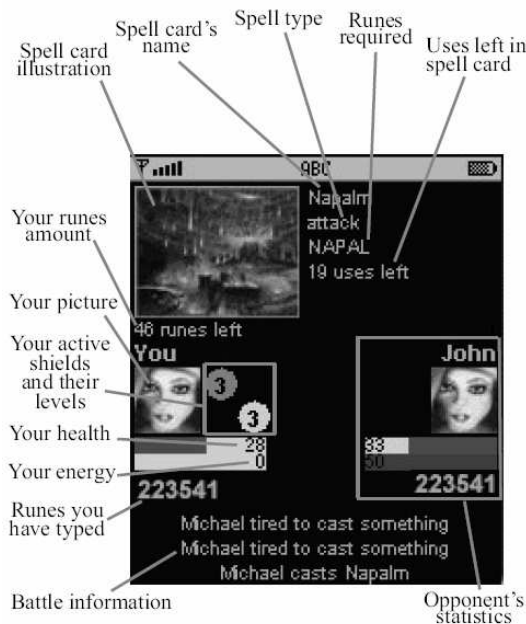
Ancient Runes

A collectible card game

of players: 2 in battle, any number of battles

Actions: As fast as can type

Session length: ?



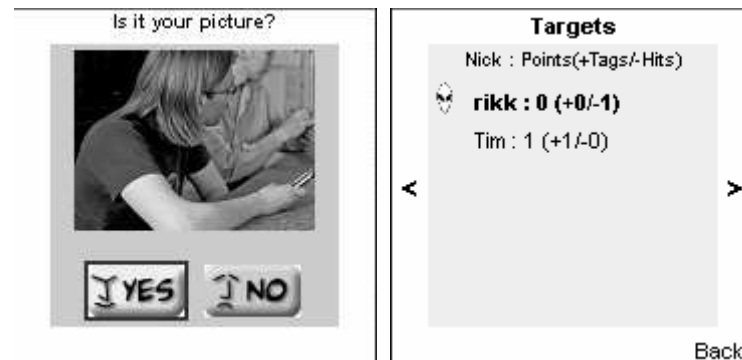
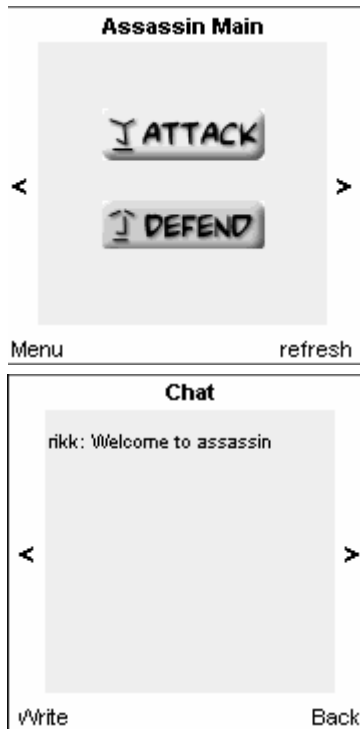
Assassin

A 1st person camera shooter

of players: any

Actions: Asynchronous

Session length: 1 minute



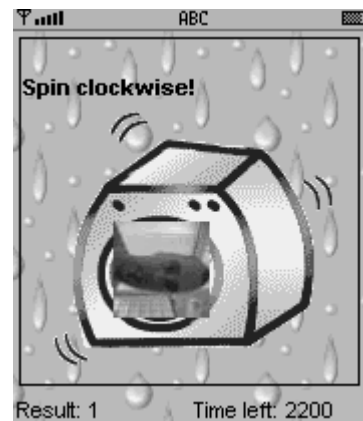
MiniGameServer

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.

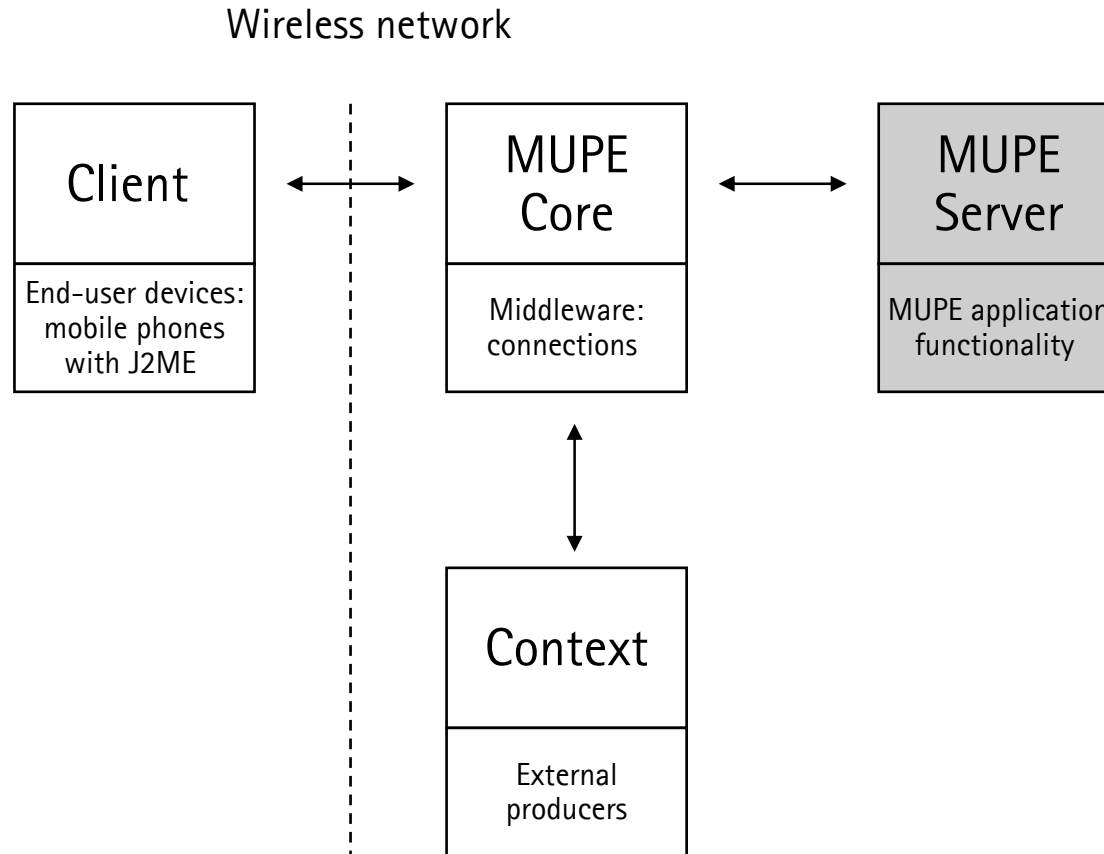
Every user of the system can take photos, record sounds, and write notes into the system.

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

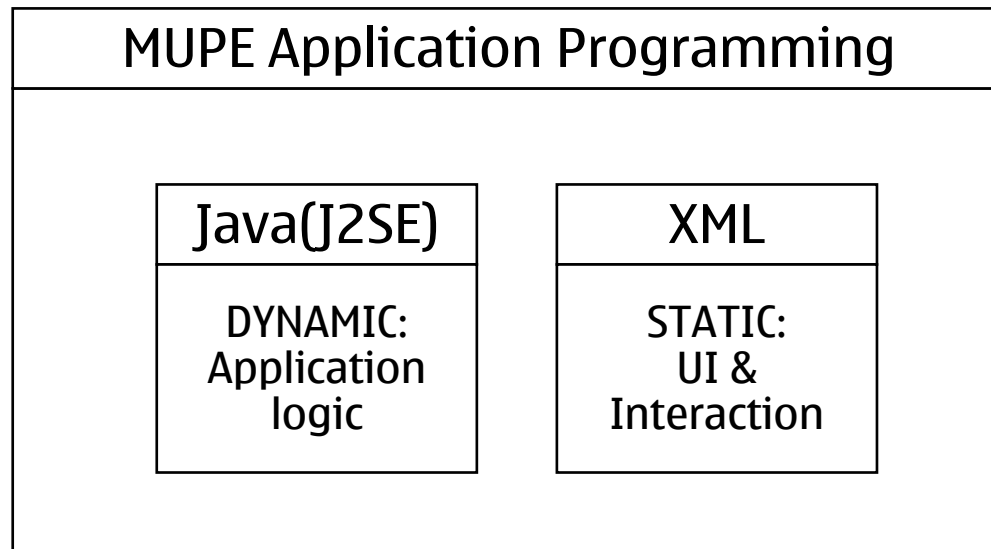
Server: Static/Dynamic separated

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

Server returns a valid UI script

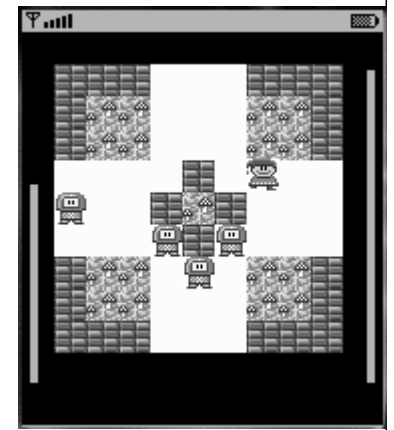
UIs can be created with XML – no need for programming/compilation

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

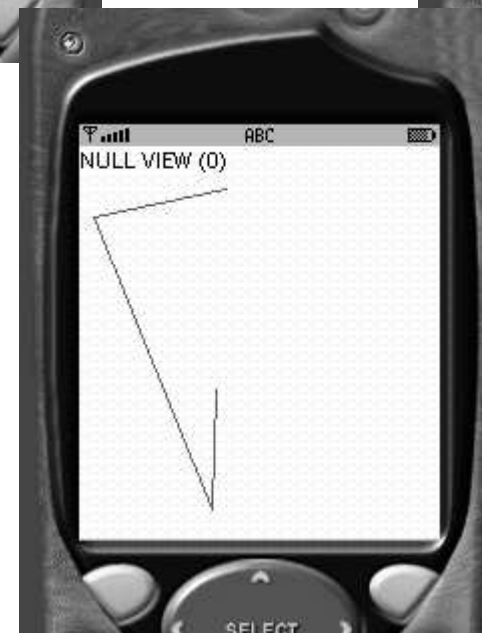
Arrangements: Location producers for MUPE

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,

1st hour design with all

2nd 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