The Panoramic VR Integration of Web-based GIS Residential Property Marketing Information System (WGPMIS)

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Commission No. 9

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• Pilot WGPMIS & its limitation
• The improvements
  – Web-based platform
  – Geoprocessing & network functions
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• Acknowledgement
Benefit of GIS for land & property management

**Tangible**: ability to visualise relationships between property and the surrounding geography

+  

**Intangible**: data audit and cleaning  

(Wyatt & Ralphs, 2003)

+  

Web & 3D visualisation + Panoramic VR

=  

**POWERFUL MARKETING TOOLS**
In reality...

- Housing buying and selecting - site visiting and verbal communication
- Some of the property developers and estate agents have advertise their property on the web for selling and renting purposes
  **BUT!**
- consumer still have to go to the site in order to get the real situation on the ground and the physical state of the property

In reality...

- Making decision
  - identifying locations and the residential features
  - time consuming process
  - consumers delay
- Graphic map
- Limitations
  - Lack of interior looks
  - No details location & terrain information
  - Visit the potential site is often require
Current development in property marketing system: Malaysian scenario
...and many more...

What we have developed before...
The pilot WGPMIS

Levels of User

<table>
<thead>
<tr>
<th>The User Interface Functions</th>
<th>Guest</th>
<th>Registered Users</th>
<th>Admin User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer Search</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Radius Search</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3D GIS View</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Search Advertisement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>View Advertisement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Edit Property</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manage property</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>
## System Functions

<table>
<thead>
<tr>
<th>GENERAL FUNCTIONS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query Search</td>
<td>Search function by query form according to attributes</td>
</tr>
<tr>
<td>Buffer Search</td>
<td>Query intended to visualize surrounding area of the selected features within the specify buffer parameter.</td>
</tr>
<tr>
<td>Radius Search</td>
<td>Query intended to visualize surrounding area of the selected point of interest within specify radius parameter.</td>
</tr>
<tr>
<td>3D GIS View</td>
<td>Viewing housing area in Perspectives View</td>
</tr>
<tr>
<td>View Advertisement</td>
<td>View property advertisement</td>
</tr>
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<th>REGISTERED FUNCTIONS</th>
<th>DESCRIPTION</th>
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<td>Viewing housing area in Perspectives View.</td>
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<tr>
<td>View Advertisement</td>
<td>View property advertisement.</td>
</tr>
<tr>
<td>Edit Property</td>
<td>Owner/agents can advertise their property and edit or remove their advertisement also edit/update/change their property information.</td>
</tr>
<tr>
<td>Manage Property</td>
<td>Exclusively for the system Administrator</td>
</tr>
</tbody>
</table>

![Interactive coordinate](image1.png)

![Function buttons](image2.png)
From a Relational Database

Editing Pre-existing database

Clicked on the Manage Property button to get this window

Animation files updating

Clicked at Update button to complete updating task

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The limitations: numero uno

- Not actually a web-based platform
- Based on VB programming language
- Very dull, static, back dated & not interesting interface

```vbnet
Private Sub btnLogin_Click()
    If (txtUserName.Text = "Admin" And txtUserPass.Text = "password") Then
        lLogin = True
        lAdmin = True
        sUsername = "Admin"
        Unload Me
    ElseIf (txtUserName.Text = "user" And txtUserPass.Text = "user") Then
        lLogin = True
        lUser = True
        sUsername = "User"
        Unload Me
    ElseIf (txtUserName.Text = "" And txtUserPass.Text = "") Then
        lLogin = True
        lGuest = True
        sUsername = "Guest"
        Unload Me
    Else
        MsgBox "Invalid username or password.", , "Login Error"
    End If
End Sub
```

The limitations: numero duo

- Geoprocessing capabilities: no geometric network available on radius & buffer query
- Search have to be on the range of network distance & accessibility through road
The limitations: numero tres

- Pre-recorded 3D visualisation object/scene linked from property attribute table
- Static & not interactive

The improvements: numero uno

- ArcGIS Server as a new platform
- Coupled with highly interactive Flex viewer
- Viewed in desktop, web-based & even mobile (Android & iOS)
The improvements: numeroun
The improvements: numero uno

The web application

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The improvements: numero deux

- Enhanced geoprocessing engine & geometric network functions using ArcGIS server tools
- Improving
  - Street network data
  - POI data
  - Property data

1. User selects a POI
2. Create a Buffer layer of the POI based on the user specified Distance
3. Intersect buffer layer with the property polygon layer:
4. Select from the selected property polygon, with the query statement formed using the user’s input variables (Property Type and Price Range)
5. Create layer from the new selection
6. Calculate the route distance from the property to the user selected POI using network analysis
7. If more than one property is found, iterate the process in no. 6
8. Display results
The improvements: numero deux

- Attribute-based search

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The improvements: numero trois

- Photographic panoramic display to replace heavy 3D visualisation format
- Increase speed & reduce complex processing time

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More improvement
More improvement

Conclusion

• Highlight the main improvements of the conceptual design

• Three limitations of the pilot system:
  – Platforms
  – Geoprocessing & network functions capabilities
  – Complexity of 3D LOD (3D texture, façade etc.)

• Solutions
  – ArcGIS Server & Flex
  – Panoramic VR
Conclusion

• It can be embedded to the existing portal or link to it
• Powerful marketing tools for both seller & buyer
• Panaromic VR can be capture using mobile phone and uploaded to the system
• Simplicity & functionality
• To migrate into mobile platform (Android & iOS)

Acknowledgment

• Financial assistance from Malaysian Land Surveyors Board (LJT)
• Centre of Geospatial Technology (CGT), Universiti Teknologi MARA (UiTM)
Thank you for your attention!

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