Phone Analytics for Groundcrew Efficiency

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Technical Architecture

### Abstract
The Phone Analytics for Ground Crew Efficiency (PAGE) project is a proof-of-concept mobile application that revolves around exploring how mobile G.P.S. technologies can help PPL Corporation better track its ground crews on a daily basis. Specifically, PPL is interested in capturing data such as driving patterns, worksite locations, and damage reports in a much more automated and granular fashion. The first half of the project consisted of researching business requirements, project constraints, and designing the application, whereas the second half consisted of the programming and deployment of the team’s solution.

### Technical Architecture

<table>
<thead>
<tr>
<th>Mobile Phone Specifications</th>
<th>Server Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android Operating System 4.1</td>
<td>Windows Server 2008 SP 1</td>
</tr>
<tr>
<td>1 GB RAM</td>
<td>Intel Core 2 Duo CPU @ 2.66GHz</td>
</tr>
<tr>
<td>16 GB Flash Storage</td>
<td>8 GB RAM</td>
</tr>
<tr>
<td>High Resolution Camera</td>
<td>160 GB Stable Storage</td>
</tr>
<tr>
<td>SQLite Database</td>
<td>Oracle Database 11g R2</td>
</tr>
<tr>
<td>G.P.S. Capable</td>
<td>Oracle Mobile Server</td>
</tr>
<tr>
<td></td>
<td>Oracle GlassFish Server</td>
</tr>
</tbody>
</table>

### Business Requirements
- Runs on the latest stable release of the Android operating system
- Leverages G.P.S. technologies for data gathering and route tracking
- Takes geo-coded images of worksites
- Allows for asynchronous states between the application and back-end databases
- Allows for scenarios in which cellular and G.P.S. signals are not available
- Integrates seamlessly with Oracle databases
- Integrates seamlessly with MicroStrategy Business Intelligence package

### Results
- Application was successfully coded on schedule and within budget
- Application was successfully deployed on testing infrastructure
- Flawless integration with MicroStrategy Business Intelligence tool
- High level of client satisfaction
- Formation of research alliance between the CSB program and PPL
- Attracted Air Products and Chemicals, Inc.’s interest in researching the business value of mobile technologies
- Formation of research alliance between the CSB program and Air Products and Chemicals Inc.

### Final Deliverable

#### Default User Interface
- Page
- Route Tracking Status: Off
- For Job Number: N/A
- Damage Report
- Employee ID
- Job Number
- Reason Code: 30 Limb On Wire
- Cause Code: 00 Unknown
- Reason Code: 122 O'H Transmission Acquiring GPS signal...
- Take a Photo

#### Route Tracking Feature
- Page
- Route Tracking Status
- For Job Number: 115
- Damage Report
- Employee ID
- Job Number
- Reason Code: 30 Limb On Wire
- Cause Code: 00 Unknown
- Reason Code: 122 O'H Transmission GPS coordinates found

#### Photograph Feature
- Page
- Take a Photo
- Submit

#### Submission of Final Report
- Page
- 118
- Reason Code: 30 Limb On Wire
- Cause Code: 00 Unknown
- Reason Code: 122 O'H Transmission
- GPS coordinates found
- Damage Report Submitted Successfully

### Future Work
- Expansion of application to iOS tablets
- Construction of more advanced MicroStrategy dashboards
- Extensive unit, regression, and acceptance testing
- Deployment on a production level

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