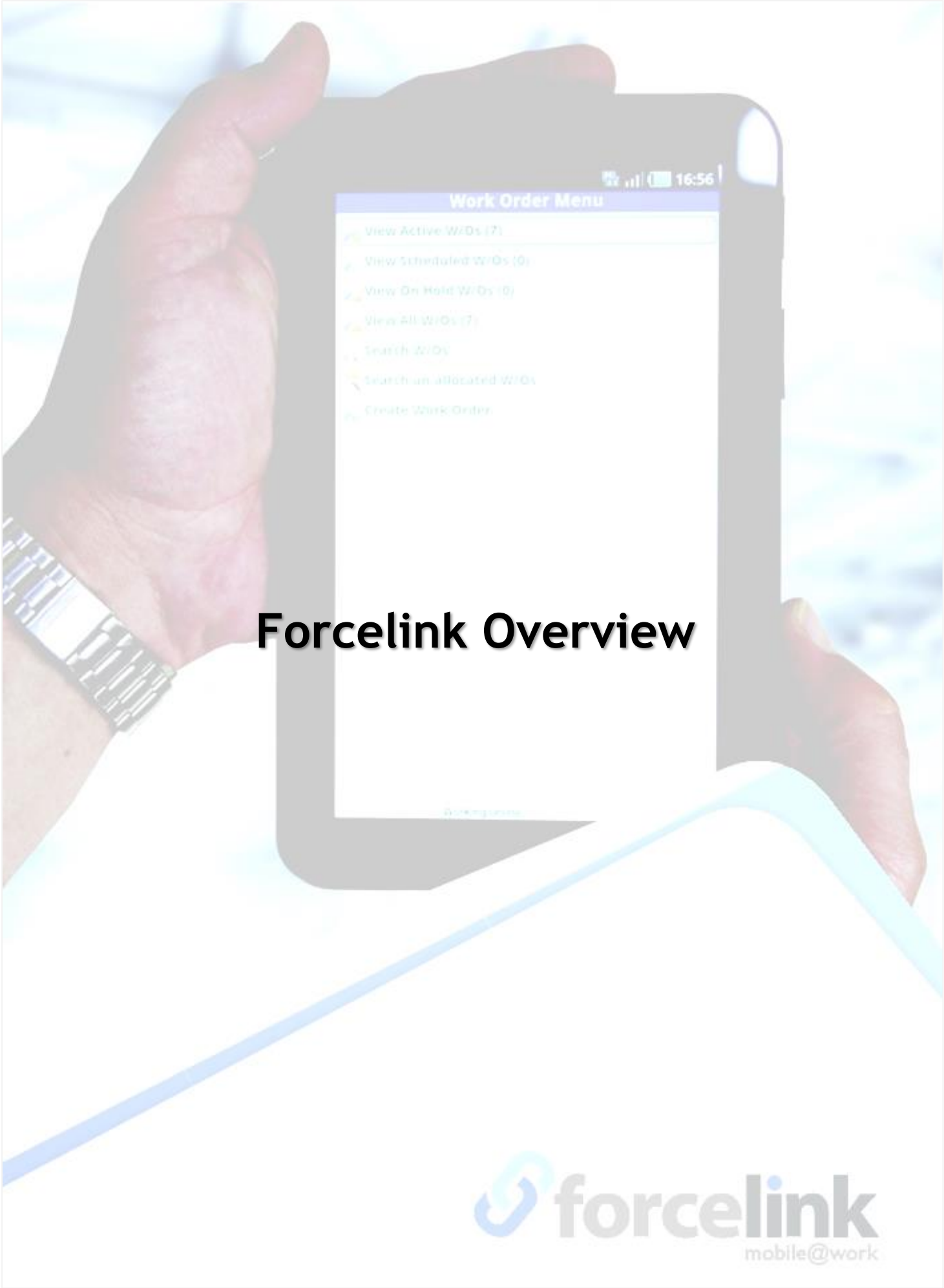
acumen software

forcelink mobile@work



Forcelink Overview

April 2016

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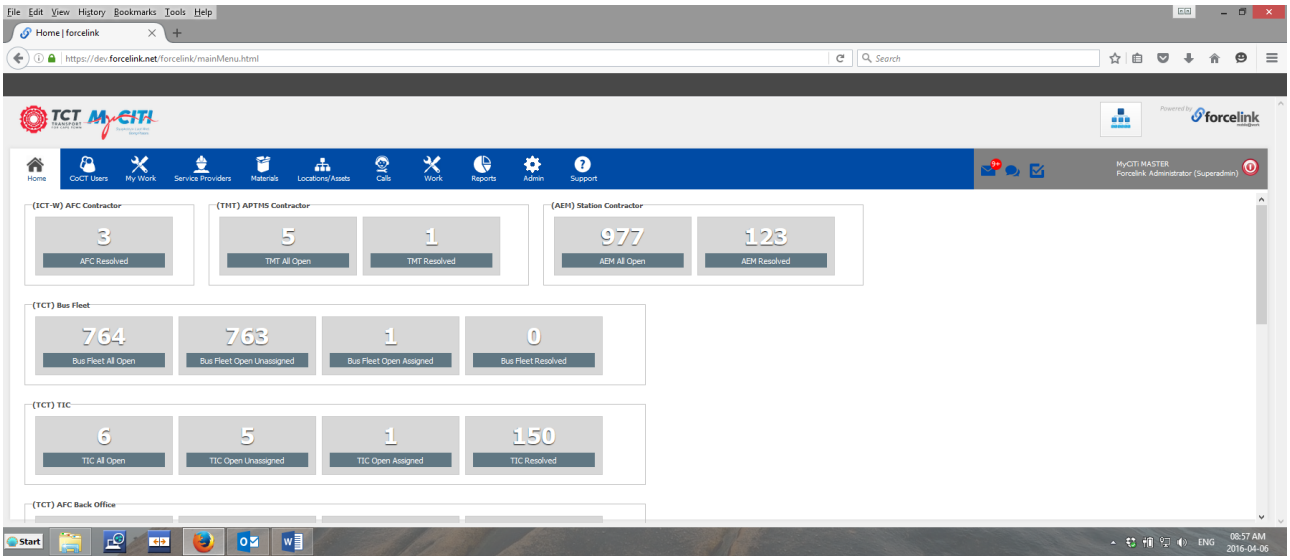
INTRODUCTION



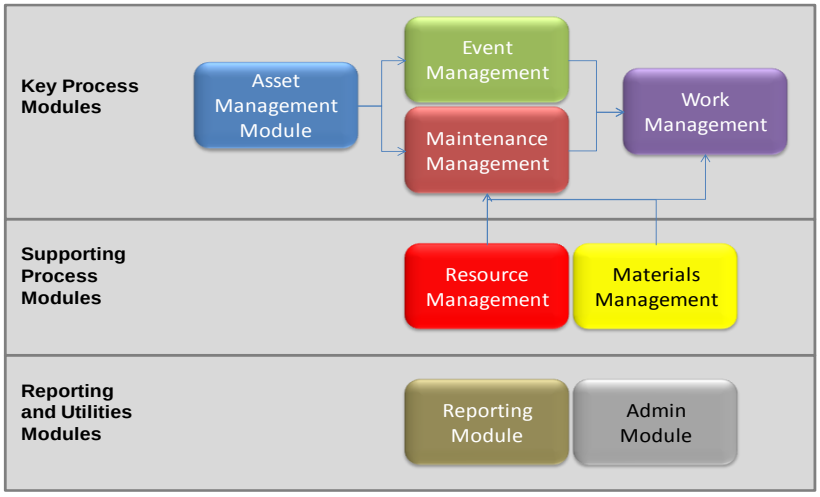
About Forcelink

Acumen Software are the developers of the Forcelink Mobile Workforce and Asset Management System. Forcelink is a mobile-enabled Service Desk and Workforce Management platform which is implemented as a hosted solution (SaaS – Software as a Service) to cater for subscribers from single operators to large businesses who wish to automate workflow processes with their mobile workforce. The product functions on any standard mobile phone that uses at least WAP to communicate with field resources. The product is very user configurable, allowing a wide variety of businesses to customise the application to their specific needs.

The Forcelink system consists of a web-based management console application which serves as a Service Desk, and a mobile application which can run on a wide variety of standard mobile phones and tablets. The solution comprises comprehensive asset data collection and management functionality, including sophisticated data collection templates, and makes use of the handheld's GPS, camera, bar-code scanning and navigation functionality to ensure that users can accurately get to the site, capture information correctly with minimal free-text entry, and use photos and GPS tracks as proof of time and place.

The system provides integration services to integrate to back office business applications such as Accounting systems, HR, Work Management, Plant Maintenance, Customer Information systems, GIS, etc.

The solution has comprehensive service desk and work management functions, supported by the following modules:



A Cloud-Based Service Model

Forcelink is offered in a cloud technology model, or *Software as a Service (SaaS)* model, which is a **low risk** and **cost effective** model. With minimum up front capital expenditure, the system can be deployed in a few weeks, depending on integration complexity and scope. Our clients do not have to worry about managing support and maintenance contracts, and their related additional costs, costs for hardware and other 3rd party software, such as Oracle database, etc. Furthermore, being a web based solution in a cloud model means that the system is available all of the time, and can be accessed from anywhere, using any web connecting device. This includes cell phones and tablets.

The solution is hosted in three different data centres in Cape Town, Johannesburg, Dublin in the Republic of Ireland to ensure 99.9% availability of the system 24/7.

Advantages of Forcelink

- Real-time Online Electronic System
  - Gives an instant view of real status, no lag or delays in downloading data
  - Real-Time monitoring and reporting on progress reduces administration effort for the project management team
- Web-based
  - All authorised users can access and monitor the progress and draw reports from anywhere, at any time
- Fully Mobile-enabled with Preconfigured Data Capture Templates

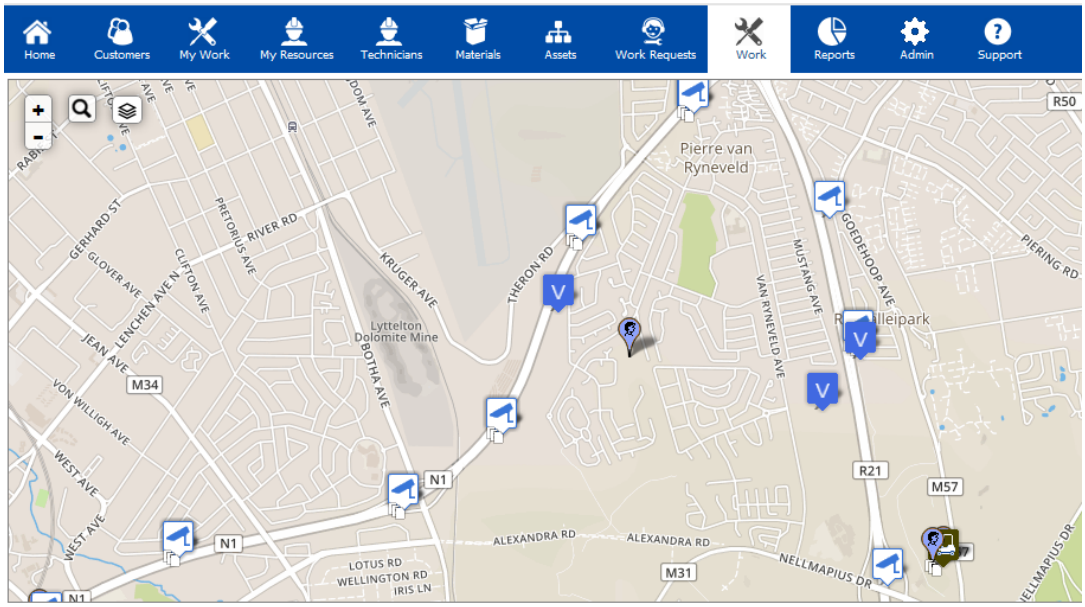
- Inspection Lists and complex multi-point data capture templates can be configured very quickly through the admin functions on the management console, and immediately be made on the mobile phone
- A paperless system with accurate data capture directly from the field. Human error is eliminated from the capture process

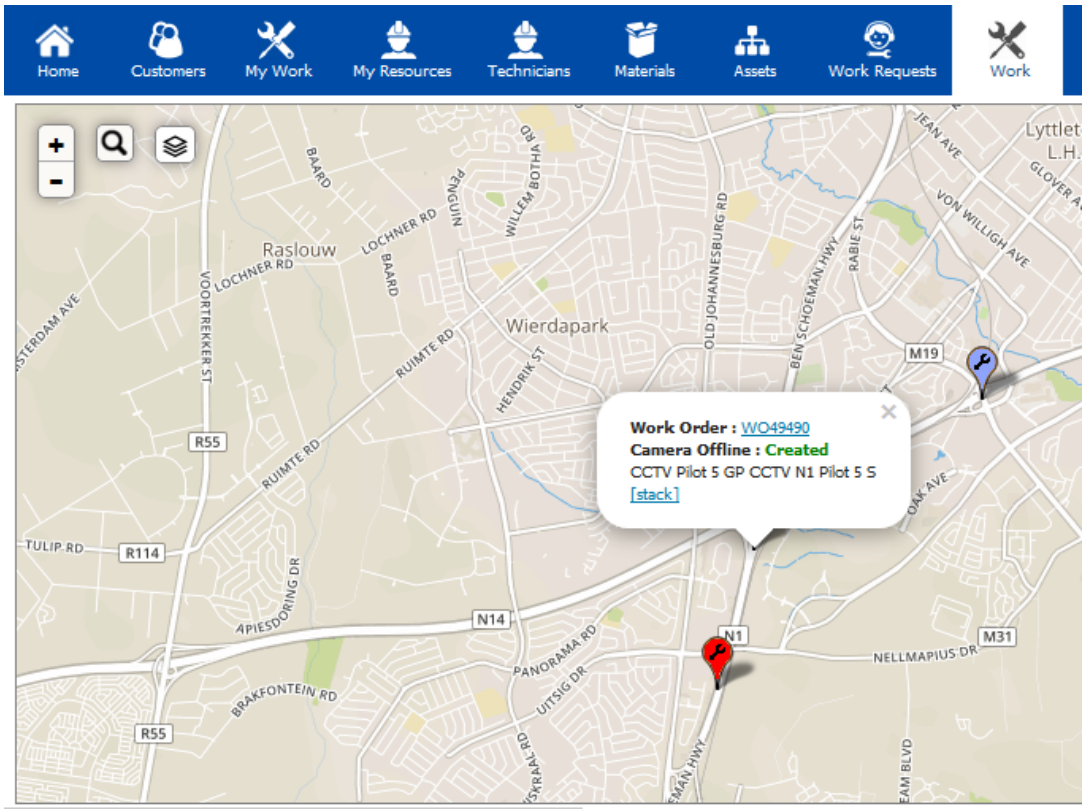
- Configurable Workflow
  - Business rules setup to automate the workflow and enforce compliance
  - Saving on administration costs through automating processes and reducing time-consuming paperwork
- Comprehensive Audit Trail of all activities on the system
  - Data captured is verifiable with date-,time stamps, GPS location, secure user ID of field user, etc
  - Contribute to the productivity improvement of field staff through time management (using the mobile to clock in and out) and tracking of movements via GPS. This can also lead to reductions in overtime costs while maintain acceptable levels of customer service.
- Integrated Reporting
  - All the audit reports are configured upfront. No need for manual collation of data or inconsistent and unreliable reports
- Independent of Mobile Phone technology
  - No upfront CAPEX for expensive field devices (MDT, PDA) – standard cell phones are used.
- Return on Investment
  - From a return on investment point of view, the subscriber model – with little to no upfront CAPEX other than minimal implementation costs, is a viable financial model
  - Very rapid implementation approach means early realisation of benefits. The solution can be fully operational in just a few weeks versus the typical solutions that take 6+ months plus to mobilise.

FORCELINK FEATURES

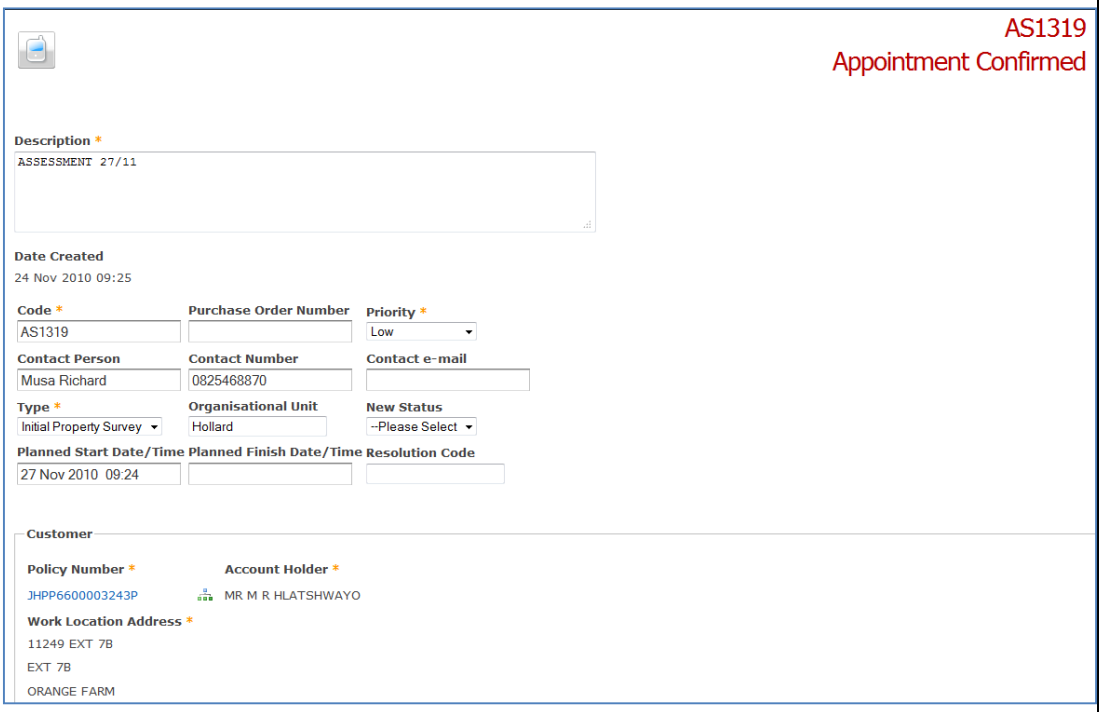
Feature Highlights:

Detailed Functionality:

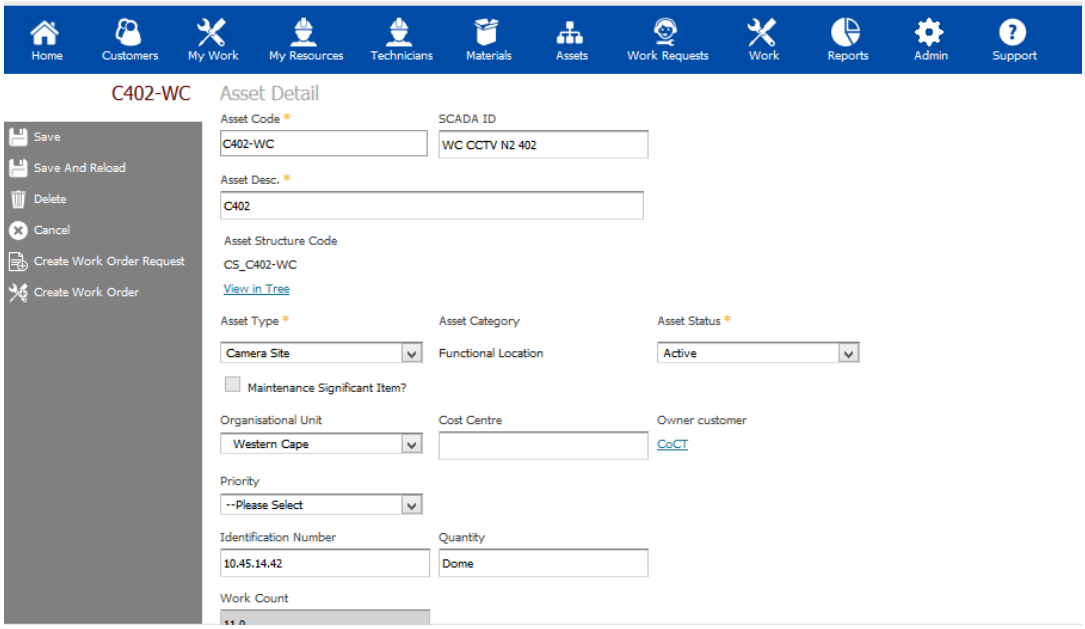
Features	Remarks
Use of Open Street *Maps* to Spatially Display different data	Forcelink uses *Open Street Maps* to render a map display of as many layers as required by the user, e.g. • Work Orders • Work Requests • Assets • Customers • Resources • Addresses • Quotations 
Auto Geo-Coding	Address information can automatically be assigned GPS coordinates by Open Street Maps
Dispatching from Map	Dispatching can be done directly from Open Street Maps by dragging & dropping resources onto work orders

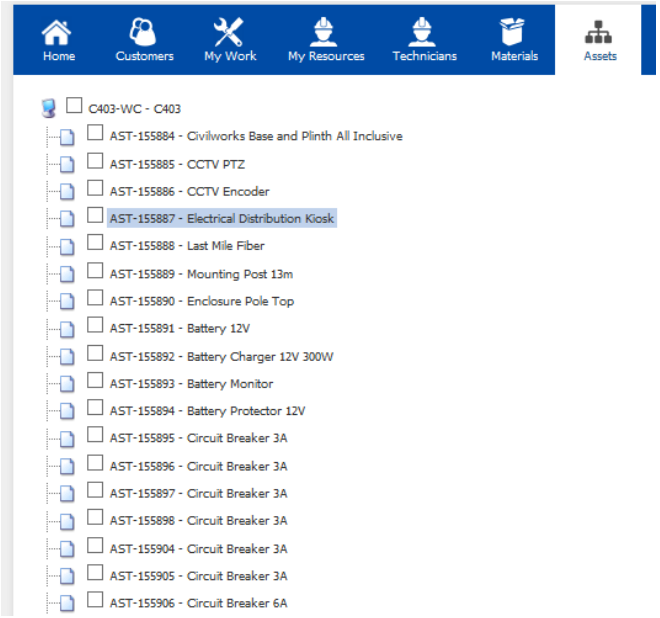
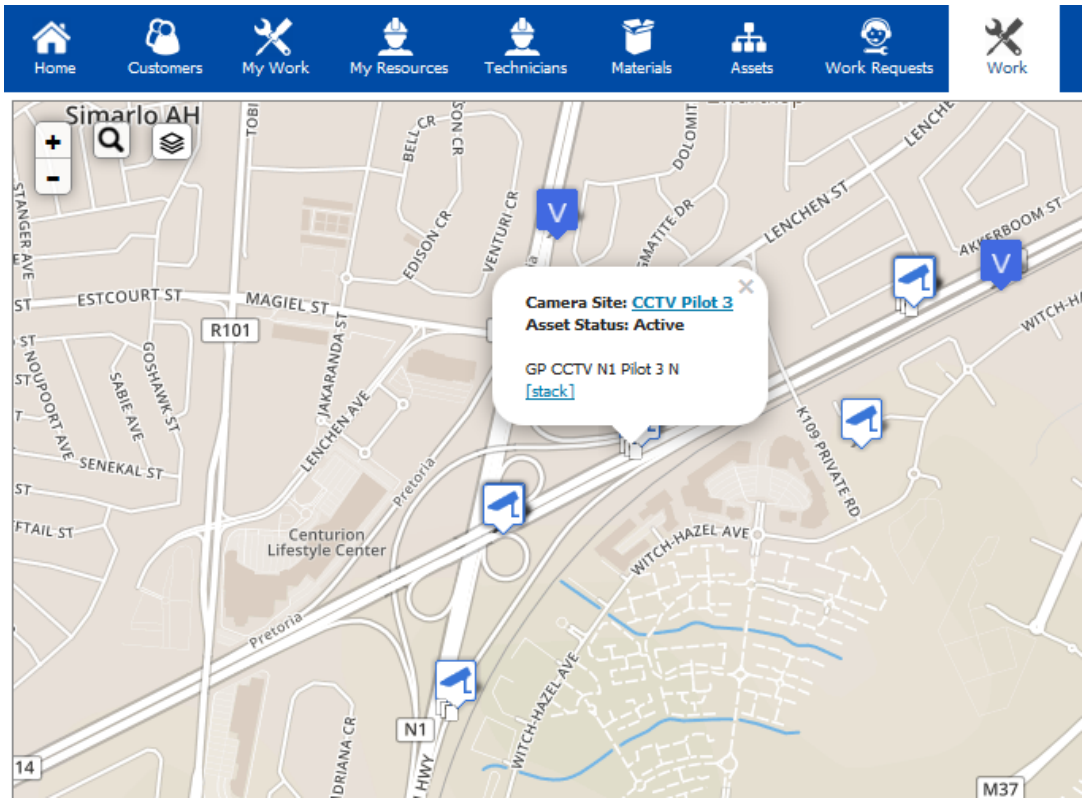
Features	Remarks
	
Enabled on a Standard Mobile Phone	Forcelink can operate on any standard mobile phone that uses at least WAP to communicate with field resources. There are four versions of the mobile: A WAP and HTML5 version that does not require any software installed on the cellular phone, this version works on-line via the phones web browser, and a Android and JAVA version, which is installed on the cellular phone. The Android and JAVA versions offer several additional features that the WAP version does not have, such as: • The ability to work off-line (when there is no cellular coverage) • The ability to track users via the phones GPS unit • The ability to use the phones camera to take photos in the field and link these with an asset or work order

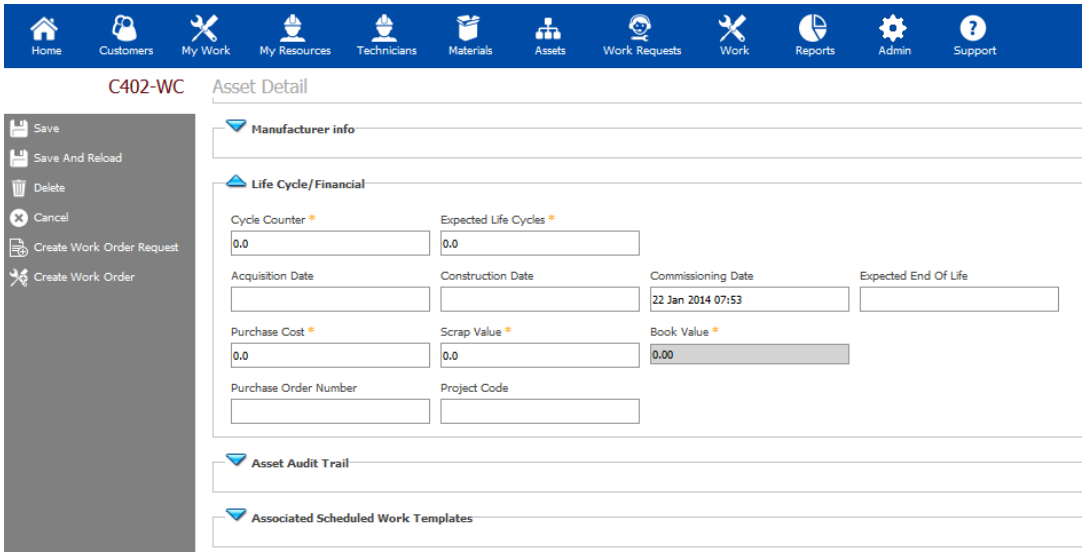
Features	Remarks
E-mail Capability	Forcelink has the capability to receive a standard email message and automatically create a “Request” on Forcelink and assign a “Reference Number”. This is achieved by creating a dedicated email account on Forcelink to which requests can be sent. An automated response email can also be sent back to the sender with a Unique Reference number to acknowledge receipt.

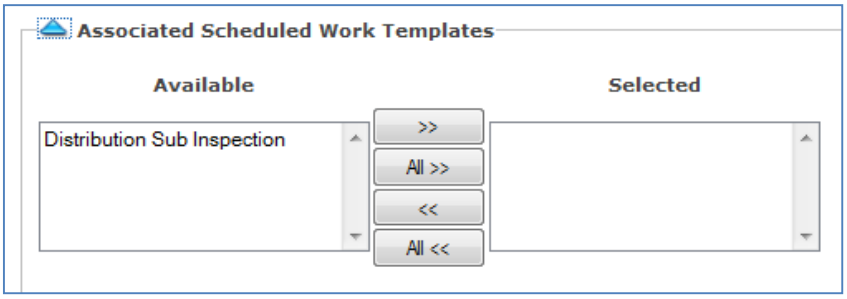
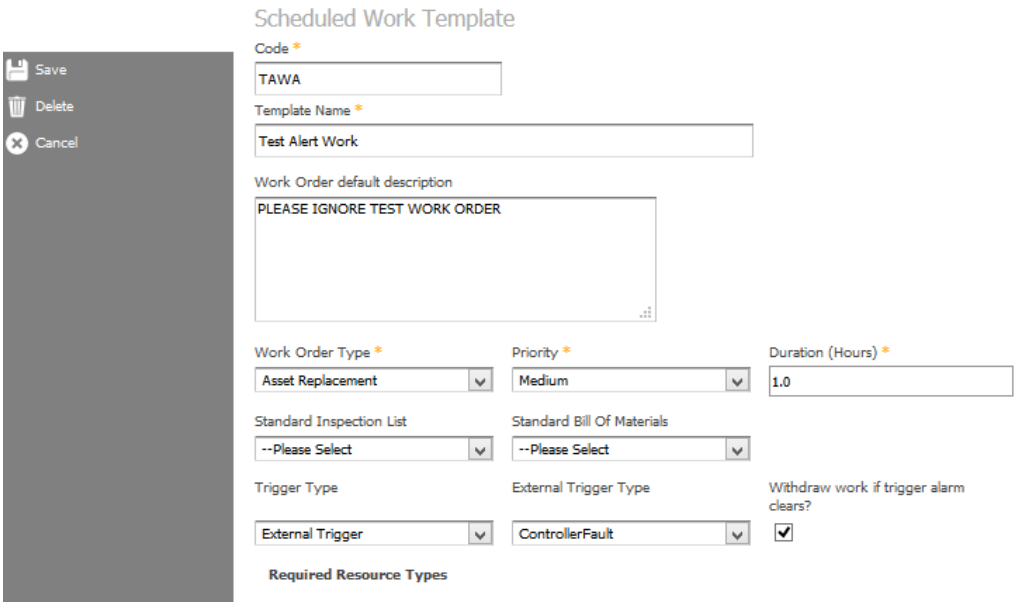
Features	Remarks
Appointment Scheduling	Appointments can be confirmed with clients and automatic notifications sent to them by SMS or email or both. 

Features	Remarks
Assigning Tasks to Field Staff on Mobile	Field users are registered on Forcelink and secure user accounts created with unique usernames and passwords. The tasks are allocated to the Technicians, Assessors, Service Providers, etc. automatically by mobile phone, with additional notifications by email if desired. On the mobile, they have the ability to • view task instructions and related detail • view customer information, including addresses, contact details, etc • view location on the map and navigate to the desired destination
Use of GPS on phone	For each job (work order, quotation, etc.) assigned to the field user, Forcelink saves a location bookmark on the user's mobile. The field resource is then able to navigate to the job using the phone's standard navigation facility.
Data-Push Messaging & SMS Notifications	Cost effective data push messaging is the primary mode of data exchange with mobile users in the field. No need to pay for SMS messages between field resources and the office. In addition to this, there is also an SMS facility to send notifications to the field resources, customers, or managers

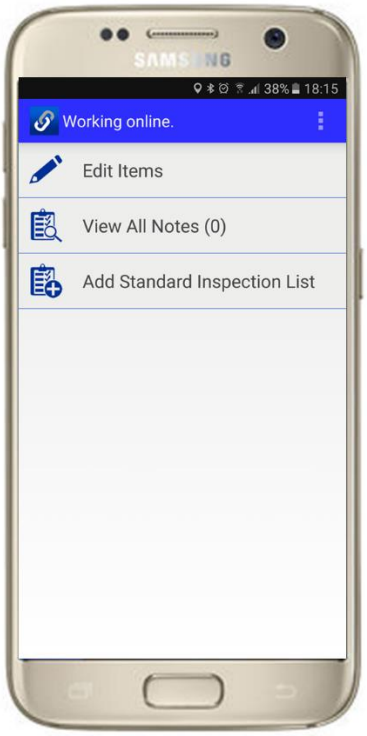
Features	Remarks
Asset Register	The Asset Module in Forcelink enables for the comprehensive management of assets and their locations. Forcelink has the facilities to allow personnel to enter asset data from the front end and from the mobile. This includes: • **General asset information**, which includes: description, code, serial number, type and category, parent and children links, MSI (Maintenance Significant Indicator), asset status, cost centre, and organisational unit. • **Structuring of asset hierarchy** to allow tracking of asset movements such as *Rotables* to and from repair stores, as well as Parent-Child relationships between the equipment and their functional locations • **Asset Address**, which includes the physical address Tagging of assets with GPS co-ordinates for positioning and tracking on the integrated Google Map • **Inspection Lists**, standard asset inspection lists. • **Documents**, associated documents. • **Associated Work Orders**, work orders, planned and operation, associated with the asset. • **Associated Materials/Parts**, standard parts and materials associated with the asset. • **Manufacture information**, information related to the manufacturer of the asset. • **Life Cycle/Financials**, asset financial information such as acquisition, depreciation and disposal information • **Asset Audit Trail**, full asset history audit trail. • **Associated scheduled work templates**, work templates for standard planned maintenance. 

Features	Remarks
	 

Features	Remarks
Asset Remaining Useful Life (RUL)	Forcelink maintains data related to the lifecycle of each asset, from acquisition to disposal. The RUL of expected end of life is calculated based on the depreciation model applied 

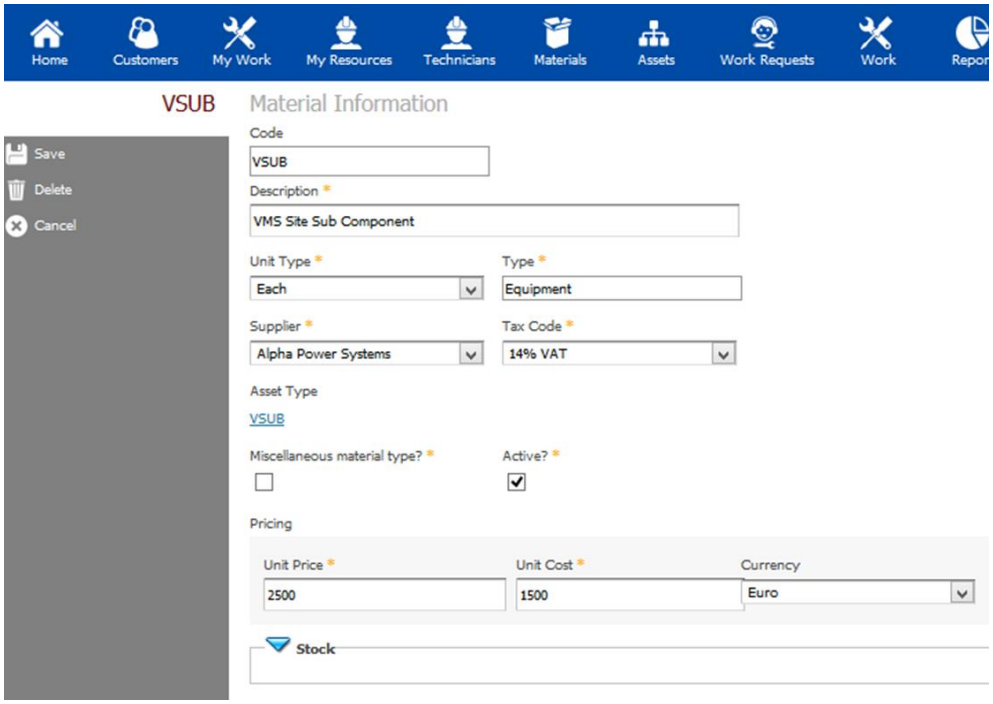
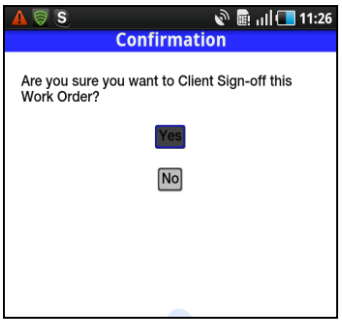
Features	Remarks
Preventative Maintenance Schedules	Forcelink creates the preventative maintenance schedules from the individual asset planned maintenance schedules. These are set against each asset by selecting the standard templates and selecting the maintenance triggers: Periodic, Trigger Based and Condition Based. The schedules update dynamically.  

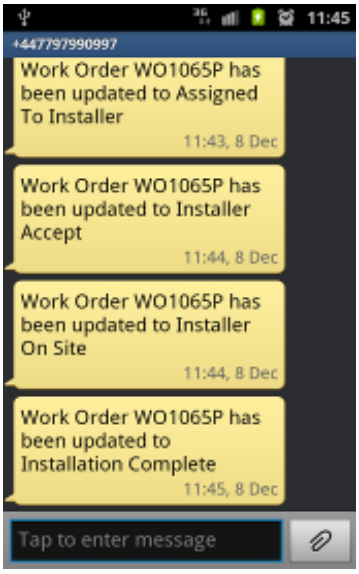
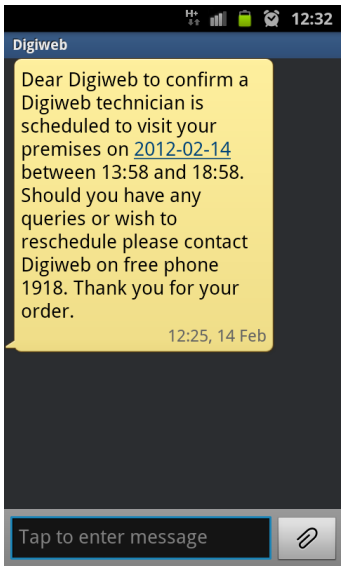
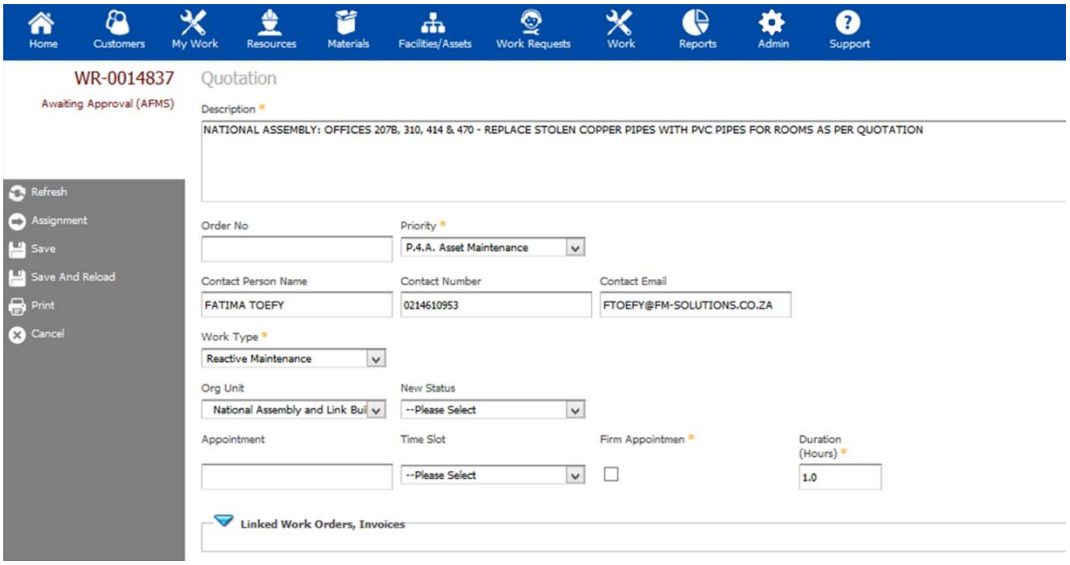
Features	Remarks
Inspection lists	Forcelink can cater for all checklists and instructions to be loaded and converted to electronic lists available on the mobile in a user friendly format. Any data type can be configured in flexible options e.g. pick lists, meter readings, etc.

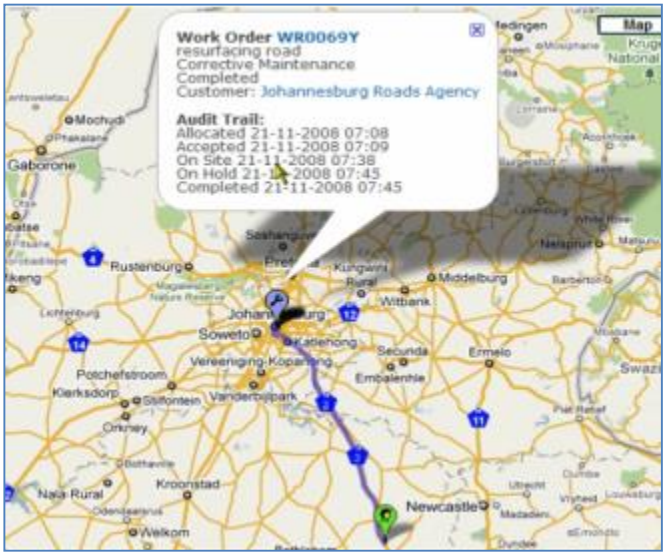
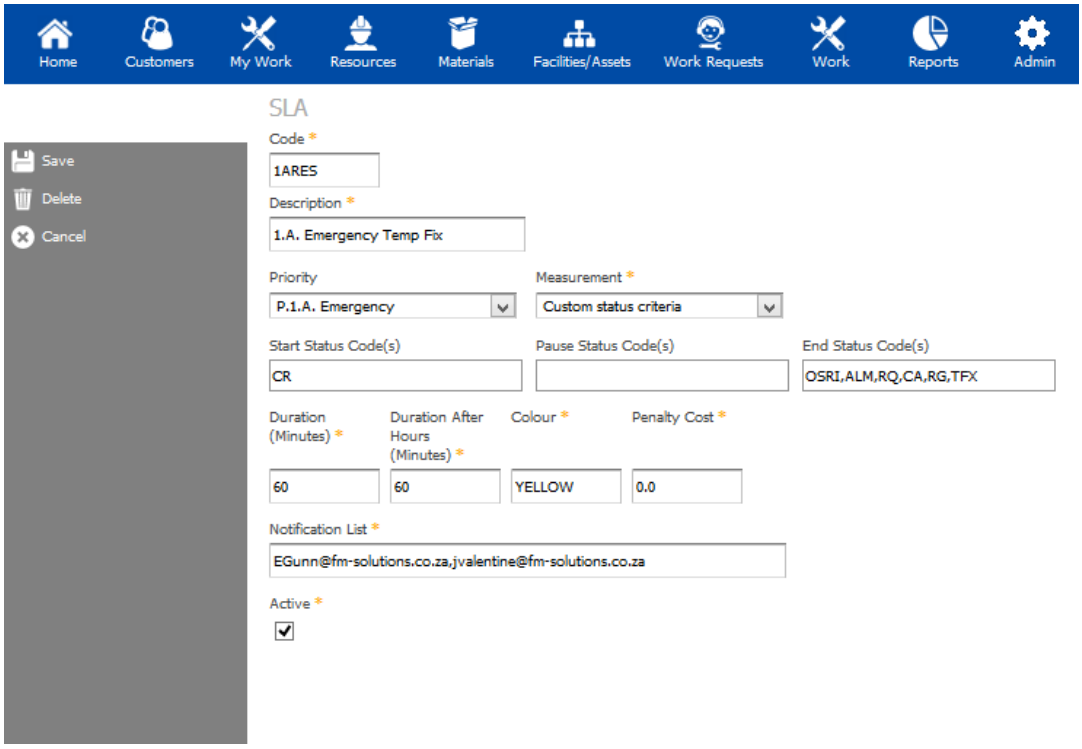


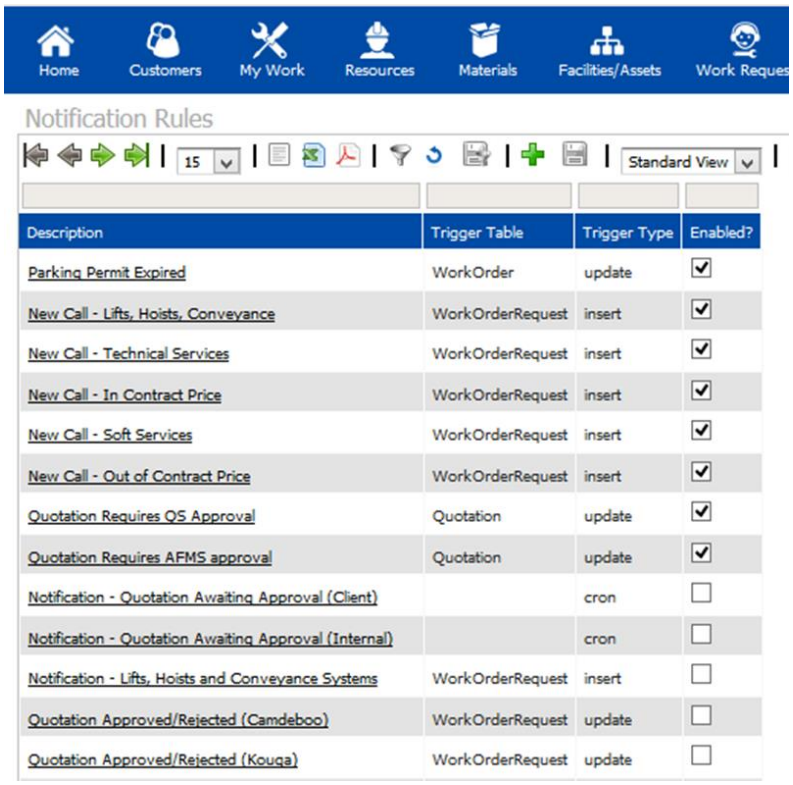
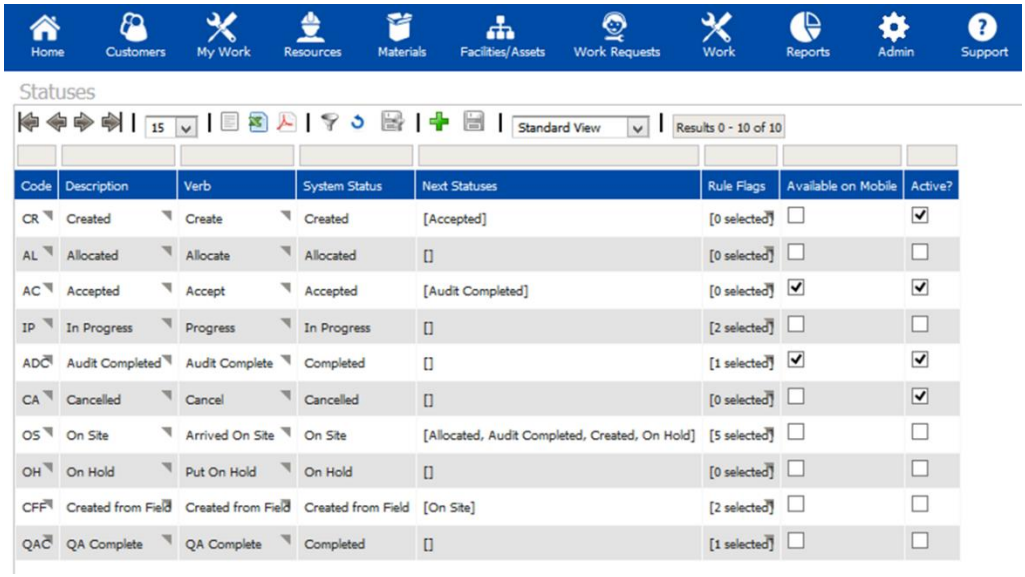
Home Owners / Buildings		
Exterior Walling	true	Brick and paint
Roof	true	Cement Tile
Perimeter fence	true	Wire Mesh
Dimensions	true	7xLength (m),5xWidth (m),35xArea (sqm)
Rooms	true	1xKitchen,2xBedrooms,1xLounge,1xBathrooms
Yard	true	Grass
Fence covers entire boundary perimeter?	true	true
There is a lockable gate?	true	true
Burglar bars installed on all doors and windows?	true	false
General Condition of Property	true	C3 - Fair
Capture GPS Reading	true	-25.855652210597,25.631064732151,1312
House Holders / Contents		

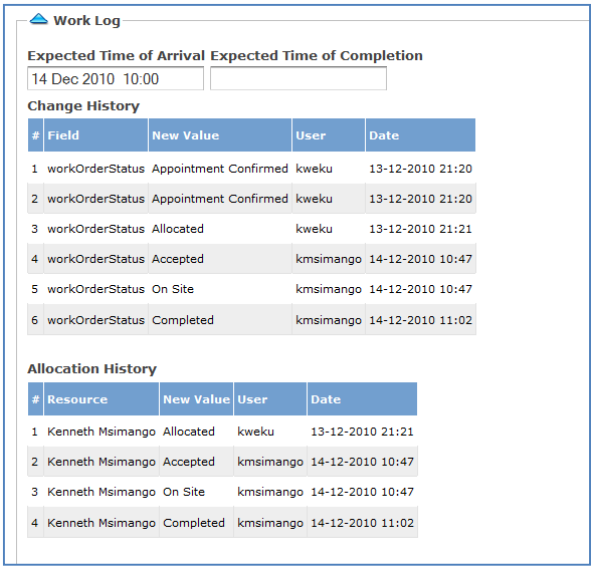
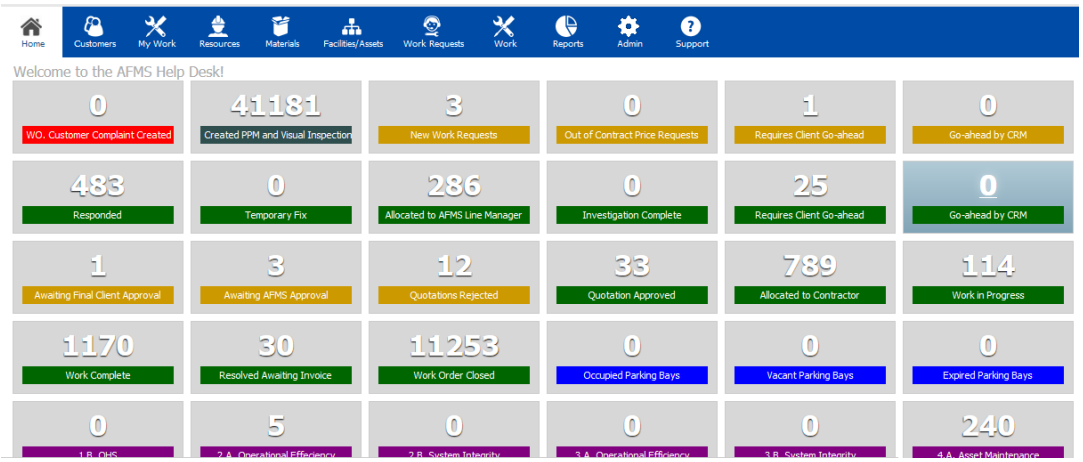
Features	Remarks
Taking Photos from the Field	Forcelink uses the cellular phone's camera to allow the linking of photos from the field to Work orders and specific inspection items on the Work order
Bill of Materials	Add materials per job / quotation from mobile

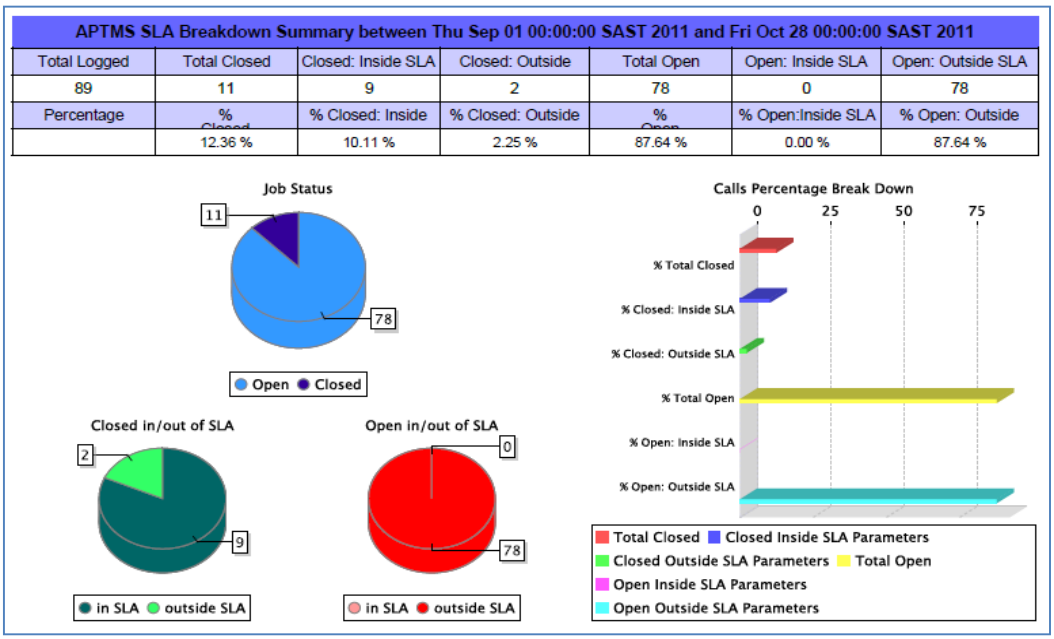
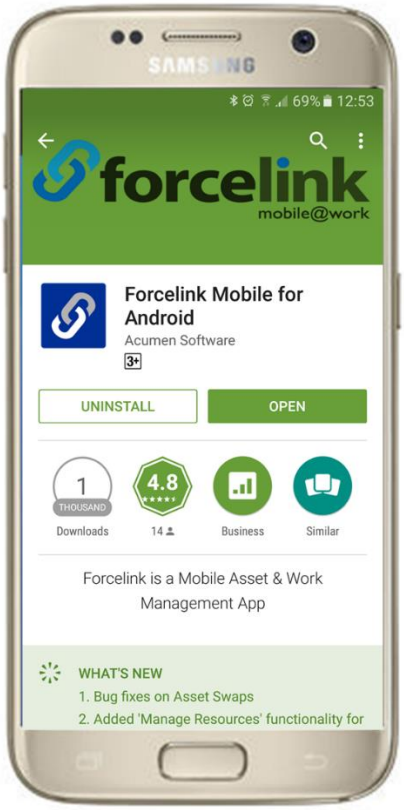
Features	Remarks
	
Secure Sign offs	Secure and auditable sign offs by Customer or Service Provider can be done from the field. There are 2 functions available which can be used separately or in combination: • One-Time-Pin (OTP): on the relevant process step, the customer is sent a unique one-time-pin (OTP) to enter into the field resource's phone. • On touch screen phones, an electronic pad is activated for a hand signature to be transcribed. This is saved as an electronic image against the jobcard
Signature Capture	Capture signature on touch screen devices (finger or stylus) 
Configurable auto-update to specified users	Update on work status by email or SMS

Features	Remarks
	 
Quotations & Invoices for Chargeable Work	Forcelink has standard functionality for quotations and invoicing: • Quotations can be issued to field resources prior to the customer accepting chargeable work. • Invoices can be automatically generated and routed to the customer the moment the job is completed by the field resource The processes and business rules for the quotations and invoicing can be configured in the workflow. 
Tracking of Resources	Shift management and tracking of resources (can use the mobile as a reliable and auditable time tracking system)

Features	Remarks
	
SLA Management	Service Level Agreements can be modelled and configured on Forcelink. SLA parameters can be linked to job / asset type or priority, as well as by stage, e.g. time to respond, repair or resolve. The SLA time constraints are also indicated on each job for the field resource to be able to view the appropriate time that the request should be attended to  Notifications can be setup to escalate events prior to the violation of SLA's. These can be sent via email and SMS.

Features	Remarks
	 Description | Trigger Table | Trigger Type | Enabled? Parking Permit Expired | WorkOrder | update | ☑ New Call - Lifts, Hoists, Conveyance | WorkOrderRequest | insert | ☑ New Call - Technical Services | WorkOrderRequest | insert | ☑ New Call - In Contract Price | WorkOrderRequest | insert | ☑ New Call - Soft Services | WorkOrderRequest | insert | ☑ New Call - Out of Contract Price | WorkOrderRequest | insert | ☑ Quotation Requires QS Approval | Quotation | update | ☑ Quotation Requires AFMS approval | Quotation | update | ☑ Notification - Quotation Awaiting Approval (Client) | | cron | ☐ Notification - Quotation Awaiting Approval (Internal) | | cron | ☐ Notification - Lifts, Hoists and Conveyance Systems | WorkOrderRequest | insert | ☐ Quotation Approved/Rejected (Camdeboo) | WorkOrderRequest | update | ☐ Quotation Approved/Rejected (Kouga) | WorkOrderRequest | update | ☐
Configurable Workflow & Business Rules	Forcelink was designed to allow multiple organisations the flexibility to change and adapt the systems workflow. Forcelink provides all of the administration tools to allow any organisation to automate their workflow to meet their specific requirements. Quick & simple workflow changes can be made from front-end without changes to source code  Code | Description | Verb | System Status | Next Statuses | Rule Flags | Available on Mobile | Active? CR | Created | Create | Created | [Accepted] | [0 selected] | ☐ | ☑ AL | Allocated | Allocate | Allocated | [] | [0 selected] | ☐ | ☐ AC | Accepted | Accept | Accepted | [Audit Completed] | [0 selected] | ☑ | ☑ IP | In Progress | Progress | In Progress | [] | [2 selected] | ☐ | ☐ ADC | Audit Completed | Audit Complete | Completed | [] | [1 selected] | ☑ | ☑ CA | Cancelled | Cancel | Cancelled | [] | [0 selected] | ☐ | ☑ OS | On Site | Arrived On Site | On Site | [Allocated, Audit Completed, Created, On Hold] | [5 selected] | ☐ | ☐ OH | On Hold | Put On Hold | On Hold | [] | [0 selected] | ☐ | ☐ CFF | Created from Field | Created from Field | Created from Field | [On Site] | [2 selected] | ☐ | ☐ QAC | QA Complete | QA Complete | Completed | [] | [1 selected] | ☐ | ☐

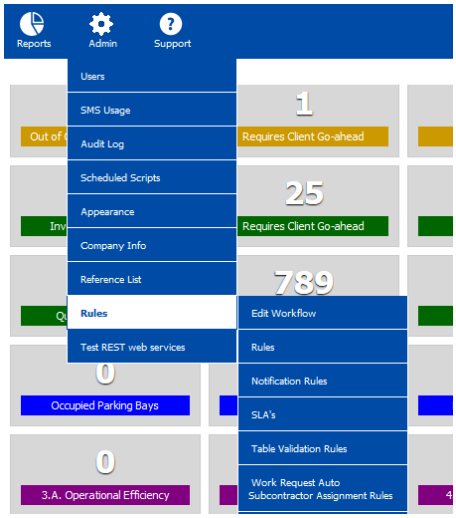
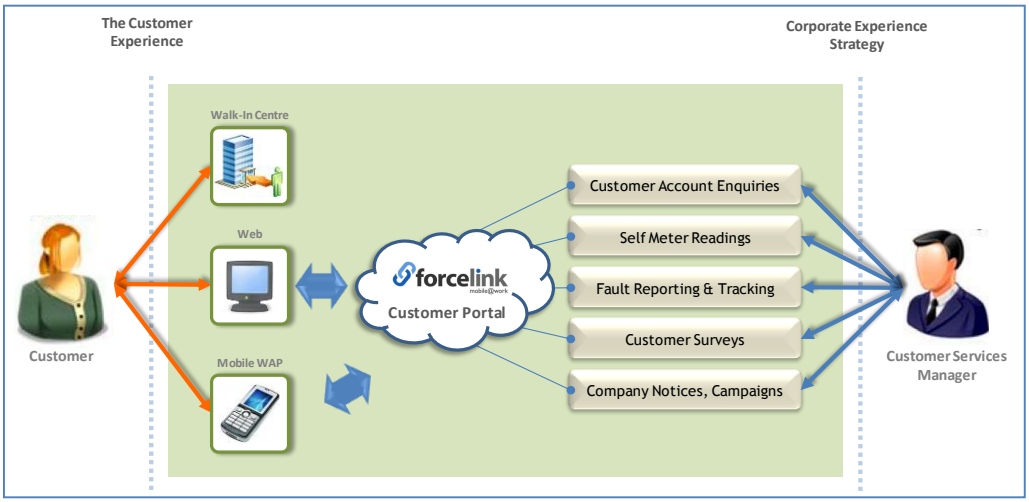
Features	Remarks
Comprehensive Audit Trail of Activities	Forcelink maintains a history of all activities as they are authorised and executed on the system. This includes activities on the desktop as well as in the field on the mobile devices  Work Log Expected Time of Arrival: 14 Dec 2010 10:00 Expected Time of Completion: Change History Allocation History
Monitoring & Reporting	There is a Management Console on the Forcelink Home screen which displays configurable KPI's for real-time monitoring of Assets and processes The KPI Dashboard can also be customised to show different KPI's based on user rights that have been configured.  A linked Reports module also allows for specific reports to be generated and automatically distributed for regular reporting. Forcelink uses iReports to generate any report the users may need. iReports is an Open Source, web based, report writer. iReports is totally integrated into Forcelink. This means that the user logs on to Forcelink and has all of the features of iReports available. In this way, data security and confidentiality can be preserved.

Features	Remarks
	
Remote Configuration of phones	Installation instructions can be sent remotely to the mobile phone to setup connection to Forcelink, including the user's log-in details. The Android version can be installed from the Android Pay Store. 

APTMS SLA Breakdown Summary between Thu Sep 01 00:00:00 SAST 2011 and Fri Oct 28 00:00:00 SAST 2011

Total Logged	Total Closed	Closed: Inside SLA	Closed: Outside	Total Open	Open: Inside SLA	Open: Outside SLA
89	11	9	2	78	0	78
Percentage	% Closed	% Closed: Inside	% Closed: Outside	% Open	% Open:Inside SLA	% Open: Outside
	12.36 %	10.11 %	2.25 %	87.64 %	0.00 %	87.64 %

Features	Remarks
Offline Capability to cater for poor network coverage	Forcelink is 100% capable of working off-line. If there is no cellular coverage the user can continue working with Forcelink. As soon as they are back in cellular coverage, the system synchronises all of the work that was done in the off-line mode with the frontend. The integrity of the workflow as well as the audit trail (actual time stamps of activities) is also preserved in the process.
System Configuration & Administration	Several administration features are available to allow the users to directly configure the solution to meet their specific requirements. Some of these include: • Ability to configure all reference data • Ability to configure fields and labels • Ability to configure all of the workflows • Ability to configure business rules • Ability to configure map layers • Ability to configure the dashboard (BI Data) • Ability to configure Notification rules (SMSs and eMails)

Features	Remarks
	
Customer Self-Service Portal	With a secure user account, customers are able to log-in to the Forcelink customer portal where they can access their specific information. 

MOBILE DEVICES

Forcelink can operate on a basic WAP-enabled mobile phone as well as more advanced Java enabled phones. The WAP version that does not require any software installed on the device, and it works on-line via the phone's web browser. The JAVA version installs an application on the mobile device.

The JAVA version is recommended because it has features that meet the following minimum functional requirements:

- The ability to do GPS Navigation & Geo-Location
- The ability to use the phone's camera to take photos in the field and link these with a customer or installation
- The ability to scan and decode barcodes using the phone's camera, where necessary
- The ability to work off-line and synchronise later (when there is no network coverage)

Supported Platforms

The philosophy behind Forcelink on the mobile has been to make it technology agnostic as far as the devices are concerned in order to give it the flexibility to be deployed in any environment at the lowest possible cost.

The JAVA version has already been developed, configured and tested on the Symbian OS, Windows Mobile, Android OS (which includes a range of Tablet PCs), and the Blackberry platform.

There are currently no plans to extend the Forcelink development to the Apple environment (iOS) due to its proprietary nature and related development and resale restrictions.

Data & Connectivity for Mobile Users

The mechanism used by Forcelink to communicate and synchronise the data from the mobile device uses very advanced compression formats to limit the amount of data traffic required.

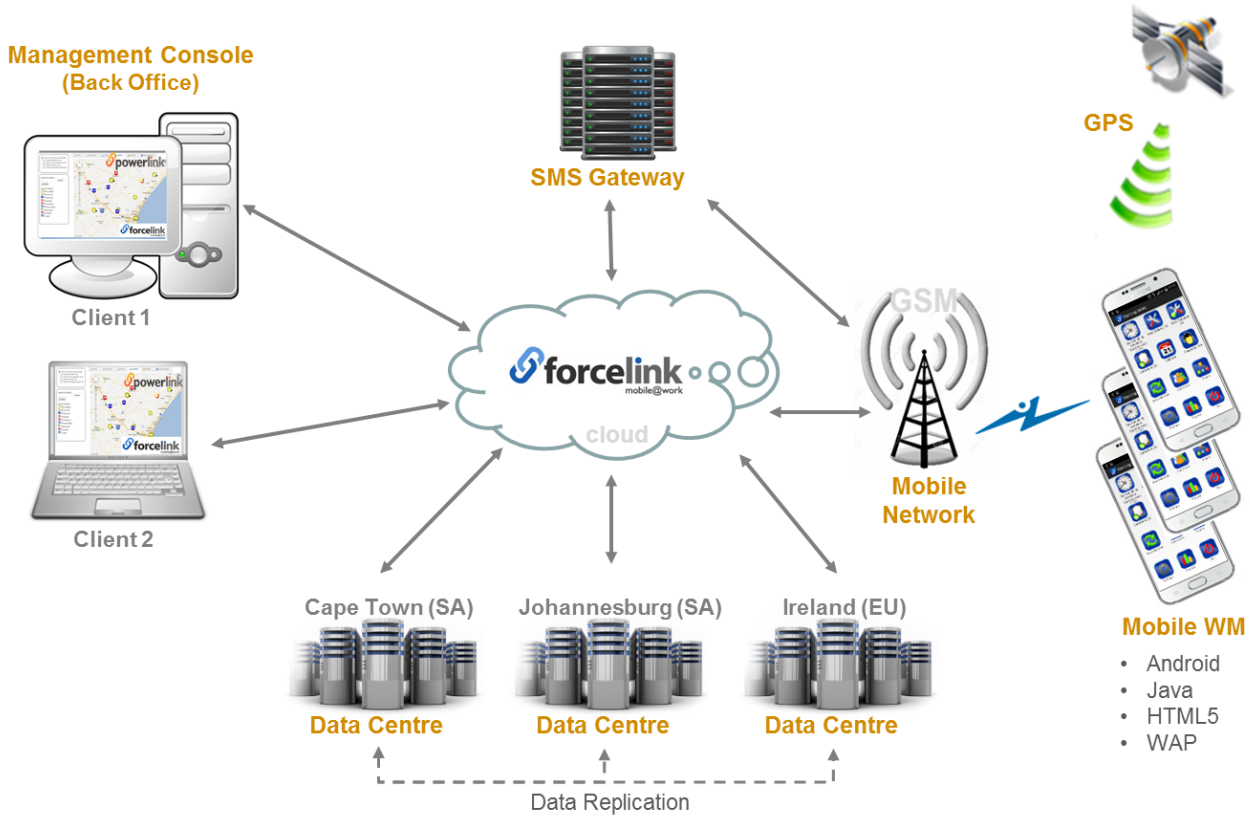
Based on information from similar projects where this solution has been deployed and the scope of this project in terms of size, we estimate that the data usage per mobile device will NOT exceed 100Mb per month.

Hence, at an approximate purchase cost of less than R0.50 per MB, the data bundle cost is negligible compared to other operating costs for the project.

FORCELINK TECHNICAL INFORMATION

Physical Architecture

The diagram below illustrates the Forcelink Solution physical Architecture. Forcelink is hosted across different Tier 1 data centres – two in South Africa and one in the Republic of Ireland with application and data mirroring between the two to ensure disaster recovery.



Forcelink functions in an N-Tier web environment which means that the solution is made available to users on the World Wide Web. Users of the frontend logon to the system via an internet browser and mobile users logon via their cellular phones – either via the phones browser (WAP), HTML5 or via our Android or JAVA mobile applications which are installed on the phone.

Data Centres

Forcelink is hosted on different Data Centres in the South African and in the Republic of Ireland.

Data Centre SLAs:

- **99.9%** Uptime Guarantee
- **24/7/365** Active Network Monitoring
- **24/7/365** Real-time Client Notification via SMS or email
- **24/7/365** Advanced Security And Monitoring Facilities

Data Centre Features:

- 1 Gigabit/second core network.
- Cable reticulation below a raised floor.
- Temperature control environment, cooled by Liebert Hiross air conditioners.
- Dedicated fire suppression equipment housed in a separate room.
- Dual power circuits so data centres run uninterrupted.
- On-site diesel generators.
- Lockable front and back cabinets.
- Regular preventative maintenance by trained personnel.

Backup's:

- Backups are performed twice daily.
- Backups include the following:
    - Database tables for each individual subscriber.
    - All uploaded files for each individual subscriber.
- Backups are kept for 1 month at the data centre.
- Backups are sent to a secure FTP server, which can only be accessed from within the RSAWeb data centre.

Disaster Recovery:

If the Forcelink server goes down for any unforeseen reason, the following disaster procedure takes place:

1. Users will automatically be redirected to the backup server.
2. Once the issue with the server has been rectified, data between the live and backup servers will be synchronized.
3. Once the data has been synchronized on the servers, the redirect will be removed in order to allow users to use the normal server.

In the event of a data issue the following disaster recovery procedure takes place:

1. In consultation with the client, the last or relevant database backup is retrieved from the backup server.
2. Depending on the data issue, a partial recovery or a full recovery of the data is loaded into the database.
3. Uploaded subscriber data such as uploaded interface files may be restored as well.

Security and Data Privacy

- Data between different Forcelink subscribers are stored on separate database schemas.
    - Subscribers have access to their data only.
- Access to the database is strictly controlled, currently only Forcelink developers have access to it.
- Personal information is not shared with any 3rd parties.
- Privacy statement at http://www.forcelink.net.

System security is taken very seriously, and as a result there are numerous security measures in place:

- Bastille Hardening program run on servers to secure the server
    - Bastille is a program which “locks down” an operating system.
    - It configures the operating system for increased security and decreased susceptibility to compromise.
- Additional measures taken to secure the operating system:
    - Secured user accounts.
    - Prompt for root’s password in single user mode.
    - Ctrl-Alt-Delete has been disabled.
    - X-Windows has been disabled.
    - Unused software has been disabled/removed.
    - Runlevel has been changed to 3.