



iTex Overview

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The iTex documentation is divided into the following sections:

iTex Overview	(This document) provides an introduction to iTex and describes the different packages in which iTex can be implemented, and the different components that are supplied as part of the system. This document is relevant for decision making staff in councils interested in implementing an iTex solution.
iTex Technical Reference	provides technical information relating to the installation and set-up of iTex in each of the available configurations. This document is relevant for IT staff preparing for and carrying out the installation and configuration of an iTex system.
iTex Operation	provides initial training and on-going help with the process of operating and administering an iTex solution on a day-to-day basis. This document is relevant for council staff responsible for administering and operating iTex.

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1 Introducing iTex

This chapter provides a brief overview of iTex and how the system works. It is divided into the following major sections:

- 1.1 What is iTex? this page
- 1.2 How iTex works page 1-2
- 1.3 SMS text messaging – a Glossary of terms page 1-4

1.1 What is iTex?

iTex is a communications system using Short Messaging Services (SMS) via mobile phones to provide a modern, two-way communication service between councils and citizens. iTex uses new and innovative ways to engage people with the council and community activity using a medium – the mobile phone text message – with which they are familiar and comfortable.

iTex offers councils a range of systems, from an off-the-shelf solution to a ‘Developer’ version that enables councils to further develop their communication strategies. See Section 2 for a description of the different iTex packages available.

The iTex solution offers councils the ability to use SMS technology to provide customers with digital receipts of transactions and an automated responder service. iTex also enables citizens to request information from their council, submit reports, and participate in opinion polls via SMS.

Why use text messaging?

The popularity of mobile phone text messaging has increased to the point where 80% of the UK population currently has a mobile phone, and over 60 million text messages are sent in the UK every day. (Sources: Internet news reports.) Most of these messages are personal, but there is no reason why councils and similar organisations cannot use SMS to their advantage.

Communication between councils and citizens can be achieved in a variety of ways, but all have their strengths and weaknesses. Relying on advertising to get a message across makes you dependent on the targeted group of citizens actually looking at the newspaper, poster or TV program where you placed the advert. Relying on conventional telephone calls for conducting transactions leads to the stumbling block of busy periods: a number of citizens all wanting to call the same council numbers at similar times of day, and giving up in frustration at the resulting queues.

SMS text messaging can circumvent these sort of problems, and also help councils to engage with younger citizens, who are perhaps the most avid users of texting.

With an SMS communication system, messages can be sent in bulk – one click to send a pre-defined message to a group of registered users. There are no queuing systems: the citizen can send an inquiry at a time convenient to them, and you can rely on the citizen actually seeing the reply you send.

There are also benefits to councils in terms of the cost of sending SMS messages in comparison with postal costs, and also in terms of staff time and efficiency. With facilities for automated reply services and the ability to send a single message to a group of recipients, the business of communicating with citizens can be significantly enhanced by implementing iTex.

1.2 How iTex works

Normal SMS text messaging takes place between two mobile phones. The sender composes the text message (using the number keys on the phone) and then dials the number of the recipient and sends the message. SMS messages are limited to 160 characters, so users often resort to abbreviations to keep messages short. For example:

```
HI M8 CU AT THE GAME SAT PM
```

This translates as 'Hi Mate, See you at the game on Saturday afternoon.' The sent message is stored by the service provider until the recipient switches on the phone, which then shows an indication that a text message has been received. The recipient opens and reads the message.

For a council to communicate with citizens using SMS text messaging, the council's end of the communication system has to be replaced with a computer system. The citizen dials what appears to be an ordinary mobile phone number, but the incoming text message is routed to a different part of the council's computer system, depending on the type of message and the processing that is required.

Similarly, outgoing text messages from the council are sent either to a single recipient (in the case of a reply to an inquiry, for example), or to a group of citizens (in cases where they have registered to receive text information about events, for example). The council's outgoing messages are not composed on a mobile phone key pad, though. The computer system includes internet-based web pages where council staff can compose the messages, and organise the distribution to the appropriate recipients.

The iTex solution consists of all the components in the computer system that handles these incoming and outgoing messages.

The components of iTex

The first requirement is for a service provider to deliver the SMS text messages from and to citizen's mobile phones. Different service providers have links with different major telecomms providers, such as Orange or T-Mobile, and each council can choose the service provider that is most suitable for their existing communications environment.

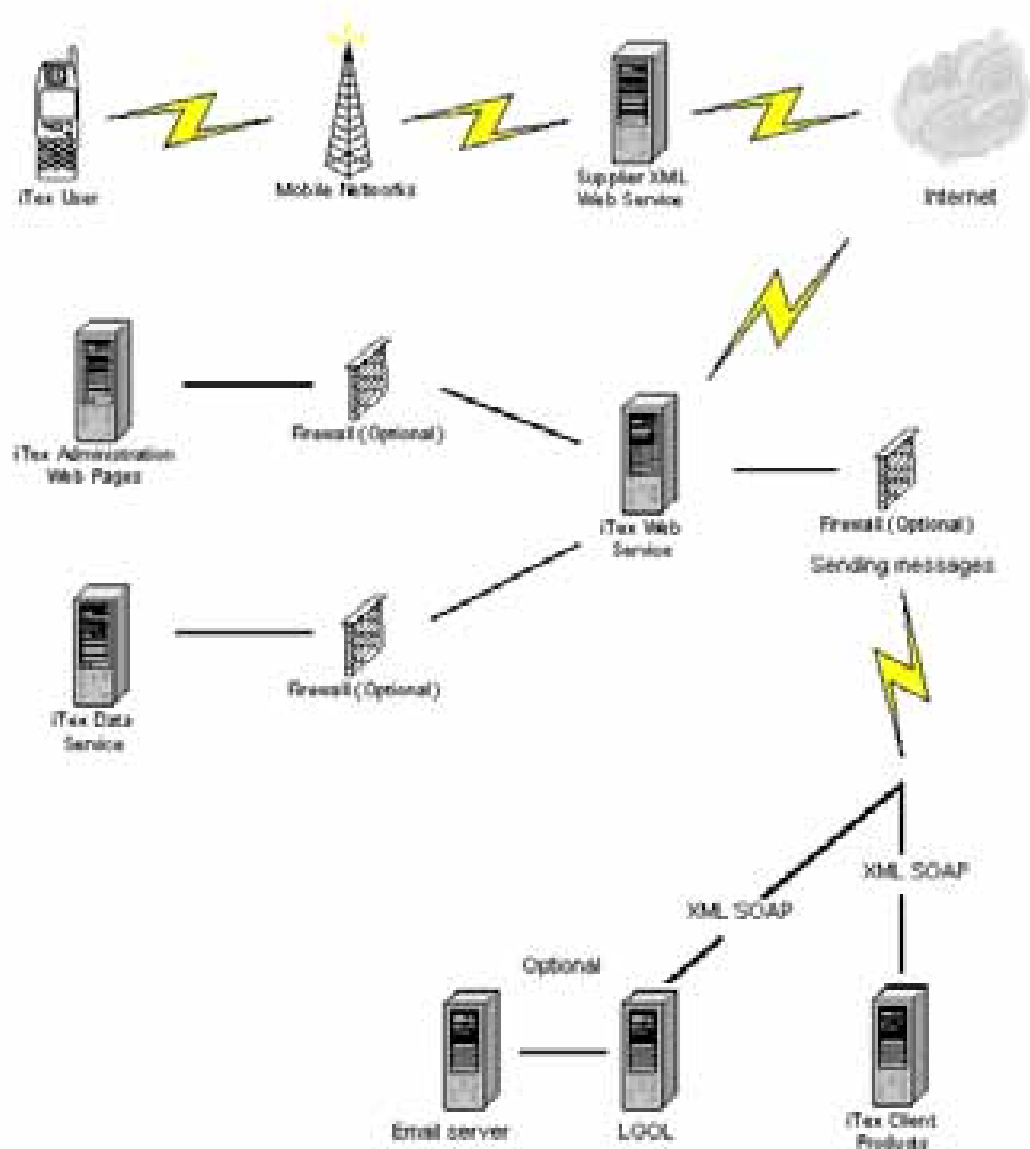
The second element is the **iTex Web Service**, which acts as a hub for all message transmissions and administration tasks. The Web Service accepts all incoming messages and either processes them directly, or else passes them to the relevant iTex component for processing.

The **iTex Data Service** provides storage facilities for all messages and administration data, including user names, internal and external accounts, and security details.

Council staff who administer and run the iTex system do so by using the **iTex Administration Web Pages**. These provide facilities for handling all user and account administration, defining message handling actions, configuring message routing based on keyword identifiers, and viewing message statistics.

The **iTex Client** products enable staff to send and receive messages, and manage their own individual contact lists. The **iTex Client** takes the form of a set of web pages with easy to use options for managing day-to-day messaging activities.

The basic structure of the iTex solution is shown in simplified form below.



Some messages from citizens using iTex can be replied to automatically, using processes defined within the **iTex Web Service** (the 'hub'). Other messages are routed to the **iTex Client** products, where the necessary processing is carried out in order to generate an appropriate response. iTex can also optionally be configured to route messages to the organisation's email server, by way of the LGOL-Net server, so that incoming text messages can be received and replied to as emails.

The design of the iTex infrastructure allows for optional firewalls between components to protect sensitive data and processes from outside interference.

Section 3 of this overview gives further details of the components shown in the diagram above that comprise the iText system.

Section 4 describes the different sorts of messaging activity that councils can set up and run using the iText system.

1.3 SMS text messaging – a Glossary of terms

The following acronyms are all commonly used in the mobile telephony industry. Familiarity with their meaning will help you to understand the iText documentation.

3G – Third Generation

A global term for the standards used in third generation phones that allow greater throughput of data. At this time, there is very little take-up of 3G phones outside major cities in the UK with only one provider in the marketplace.

API – Application Programming Interface

A piece of software that allows a programmer to create a seamless interface with another product by controlling part of another vendors application.

EMS – Enhanced Messaging Service

An extension of SMS that allows the sending of larger amounts of data, which does depend on the type of phone or device used. Typically used for downloading ring tones and graphics, EMS relies on the mobile handset's ability to use WAP. See WAP Push and MMS.

GPRS - General Packet Radio Service

A service which allows a mobile phone or device continuous access to data networks at a higher rate than GSM.

GSM – Global System for Mobile communication

A communication system that is widely used around the world for wireless communication. GSM is the second-generation communication method used in the UK.

HTTP – HyperText Transfer Protocol

The protocol used for transferring files across the Internet. Also used by some SMSCs for sending and receiving SMS messages. Some SMSCs allow secure http (https) to be used to encrypt sensitive data sent over the Internet.

MMS – Multi-media Message Service

Same as EMS but allows for more varied file types to be handled by the mobile handset.

SIM – Subscriber Identity Module

A highly miniaturised computer with a processor and memory that typically resides on a small card (a SIM card) inside a

mobile device. It stores most of the settings of the phone and some of the messages it receives.

SMPP – Short Message Peer to Peer protocol

A protocol that allows the passing of short messages over the internet. SMPP is available from all Internet based SMSCs and some offer further security by allowing the use of a VPN, to fully secure the routing of SMPP.

SMS - Short Message Service

A character based messaging service that allows a mobile phone user to send a message to another device. The message is sent via an SMSC that is programmed into the SIM card of a phone.

SMSC – Short Message Service Centre

The location where short messages are sent before being routed to the recipient. On mobile phones these are typically accessed via a phone number held on the SIM card. A growing number of SMSCs can handle the receipt of messages over the Internet using SMPP, HTTP, or SMTP.

SMTP - Simple Mail Transfer Protocol

The protocol used on the Internet for transmitting email. SMTP messages can be transferred into SMS messages and vice versa.

VPN – Virtual Private Network

Allows for a high level of security by allowing two devices to connect over the Internet by preventing access to other devices, and vice versa.

WAP – Wireless Application Protocol

The protocol used by mobile devices for connecting to the Internet.

WAP Push

Typically used in EMS in the consumer marketplace. WAP Push is the method used for pushing data to a mobile device. An SMS message is sent to a phone, which has a link to a location on the Internet embedded in it. It is this location that holds the ring tone or graphic file. WAP push can also be used to push alerts to phones, to provide notification of messages being opened, and to push application data to known applications.

There are also some functional terms used in discussing the subject of SMS text messaging. Again, a basic understanding of their meaning will help you gain a clearer view of how iTex works.

One Way Messaging

Sending messages either to a single recipient or group of recipients. A named client can send messages using a number of methods.

Two Way Messaging

Sending and receiving messages either to a single recipient or group of recipients. Incoming messages must be routed to a named client inside the iTex network using a number of methods.

email Integration

Either one way or two way messaging allowing the SMS message to be carried both ways as an SMTP email. The email can originate from a named client and the reply should be returned to the same named client.

Application Integration

Applications such as CRM (Customer Relationship Management) can be programmed to send out messages via message handling servers using an application programming interface (API). Such integration allows seamless use of SMS messaging on an enterprise scale.

Alerts

Alerts can be provided to either staff or citizens using SMS or WAP push. Basic alerts can be sent as plain SMS text messages but more interactive alerts can be programmed using links to website locations that can then link into back-office systems.

Message Receipts

SMS supports acknowledgement of sending because premium SMSCs will notify a user if a message has been unsuccessfully sent. SMS does not allow the recording of messages being read. In order to receive a 'receipt', a message should be sent using WAP push by creating a unique web based link that is visited once the message is opened.

Remote Working

Remote working can be achieved with the use of GPRS and WAP enabled applications. Remote working can be further supported with the use of alerts which can be pushed to the user.

2 iTex Packages

This chapter provides an overview of the different ways in which iTex is packaged, in order to meet differing requirements. It is divided into the following major sections:

- 2.1 The iTex packages this page
- 2.2 iTex Corporate page 2-2
- 2.3 iTex Developer page 2-3
- 2.4 iTex Lite page 2-3

2.1 The iTex packages

The iTex solution has been packaged in three different ways so that Local Authorities can choose the system requirements and the iTex products that suit their needs. The three package options are **Corporate**, **Developer** and **Lite**.



iTex Corporate

The **Corporate** package enables authorities to implement an off-the-shelf SMS communication channel. It is primarily for authorities that are looking to implement an effective strategy and do not require any further development of the products.

Choose Corporate if:

- You have skills in the installation of server software in a web infrastructure and the installation of client software on PCs and on your intranet,
- You want something “off the shelf”.

Don't choose Corporate if:

- You want to change the features and functionality.

iTex Developer

The **Developer** package is the best option for authorities wanting to take the iTex products and tailor them to suit their own needs. This is the right package for authorities with an existing SMS offering or specific requirements.

Choose Developer if:

- You want to change the features and functionality of the products,
- You have .NET development skills, and a development infrastructure similar to that required for the **Corporate** product.

Don't choose Developer if:

- You want something “off the shelf”.

iTex Lite

iTex Lite is the package for local authorities that are looking for a quick start-up SMS solution. As the **Lite** package utilises an externally hosted web service and existing telecommunications contract (administered by another council with a mobile telecommunications contract), all that is required by an authority is a web connection.

Choose Lite if:

- You have not got your own infrastructure as described for the **Corporate** product,
- You would like another Local Authority to host it for you,
- You have PCs running Internet Explorer.

2.2 About iTex Corporate

iTex Corporate has been developed as a standard off-the-shelf product that can be installed simply by inserting the CD and running the setup program, like any normal piece of commercial software.

The **Corporate** package consists of the compiled code, installation pre-requisites and documentation, documentation of the web services, the client applications and web pages, and the user guides.

This package allows a local authority to implement the **iTex** solution as shown in the infrastructure diagram in Section 1.2.

To install and set up **iTex Corporate**, the Local Authority will need skills in the installation of server software in a web infrastructure, and the installation of client software on PCs and servers on their intranet.

It is expected that this will be the preferred option for most councils.

System requirements

- Intel Pentium 2.8 ghz Server, 512 mb RAM, 80 gb HD
- Microsoft Windows 2000 Server with IIS
- Microsoft .NET Framework
- SQL Server 2000
- LGOL-Net Server (optional) with Linux, JBOSS, Tomcat, MySQL, LGOL & Java SDK

2.3 About iText Developer

iText Developer is provided for councils with plans for further development of the iText solution. This package offers all the functionality of the **Corporate** package, but delivered in a form suitable for expansion, or customisation to suit special requirements.

The **Developer** package consists of the source code, installation pre-requisites and source documentation, documentation of the web services, the source client applications and web pages, and the user guides.

This package allows a local authority to implement the iText solution as shown in the infrastructure diagram in Section 1.2, but also to add new functions and facilities to the core iText solution.

To install and set up iText Developer, the Local Authority will need .NET development skills, and a development infrastructure, as well as the basic skills required for the **Corporate** package in the installation of server software in a web infrastructure, and the installation of client software on PCs and servers on their intranet.

This option is only available to authorities who can support such an environment and would contribute to the future development of iText. The intention is that all developing authorities will share their developments, to the benefit of the overall iText community.

System requirements

- Intel Pentium 2.8 ghz Server, 512 mb RAM, 80 gb HD
- Microsoft Windows 2000 Server with IIS
- Microsoft .NET Framework
- SQL Server 2000
- Developer PCs with Visual Studio .NET
- LGOL-Net Server (optional) with Linux, JBOSS, Tomcat, MySQL, LGOL & Java SDK

2.4 About iText Lite

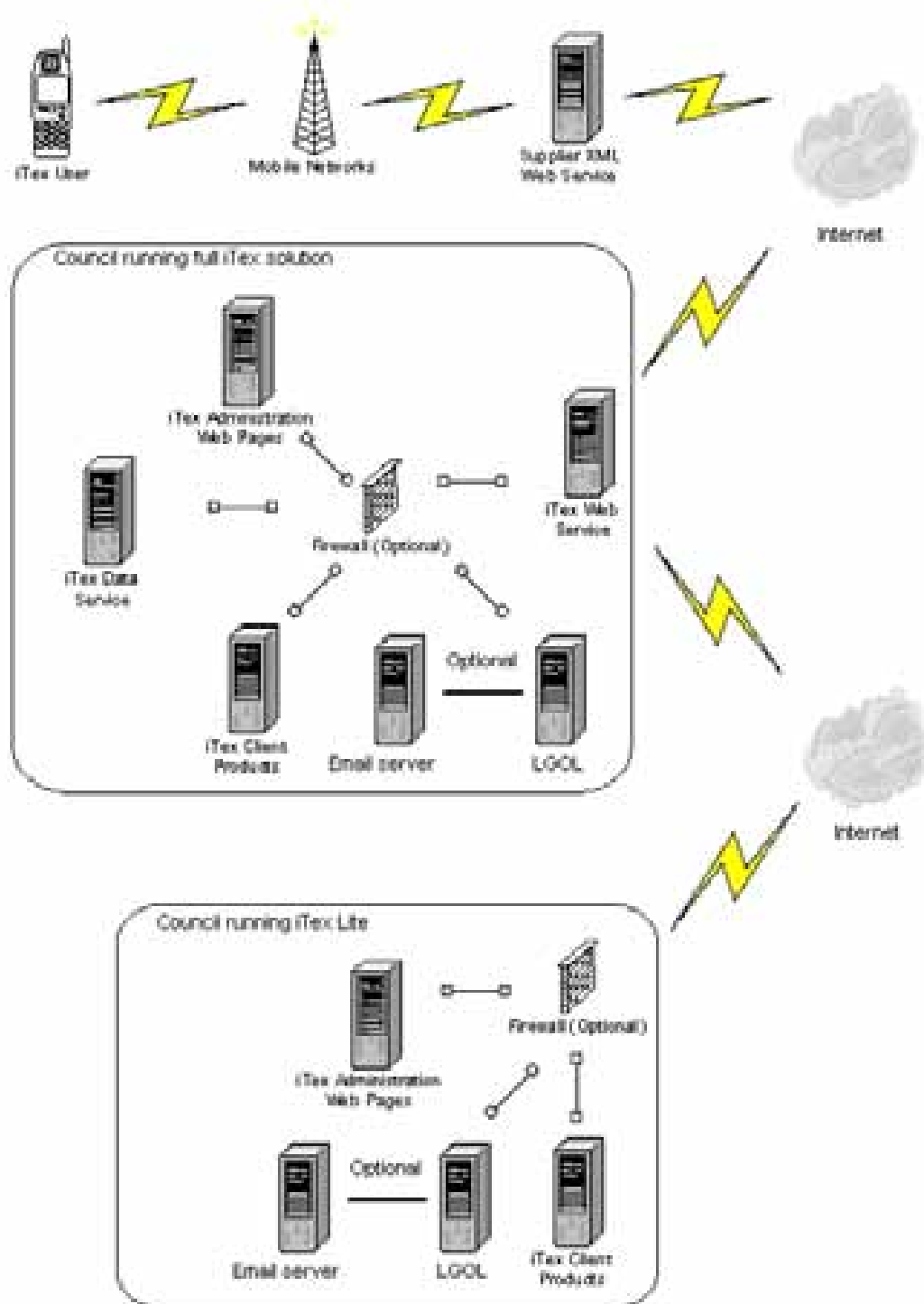
iText Lite is provided for councils with little or no communications IT capabilities, but who still want to run an SMS text messaging service. This package offers all the functionality of the **Corporate** package, but delivered in a form where the administration and operation of the system is handled remotely by another council which operates a full iText solution. The only requirement for a council running iText Lite is to have a web connection.

The iText Lite package consists of documentation of the web services, the client applications and web pages, and the user guides.

This package allows a local authority to implement the iText solution as shown in the extended service diagram (on the next page), as long as it has arranged for access to another authority's web service.

To install and set up **iTex Lite**, the local authority will need skills in the installation of client software on PCs and servers on their intranet, and sufficient network security to mitigate against any risk to the remote authority hosting the core web service.

The basic structure of the **iTex Lite** solution is shown in simplified form in the diagram below.



The council running **iTex Lite** does not need to host the Web Service or the Data Service, and simply administers the **iTex** service via an internet connection.

System requirements

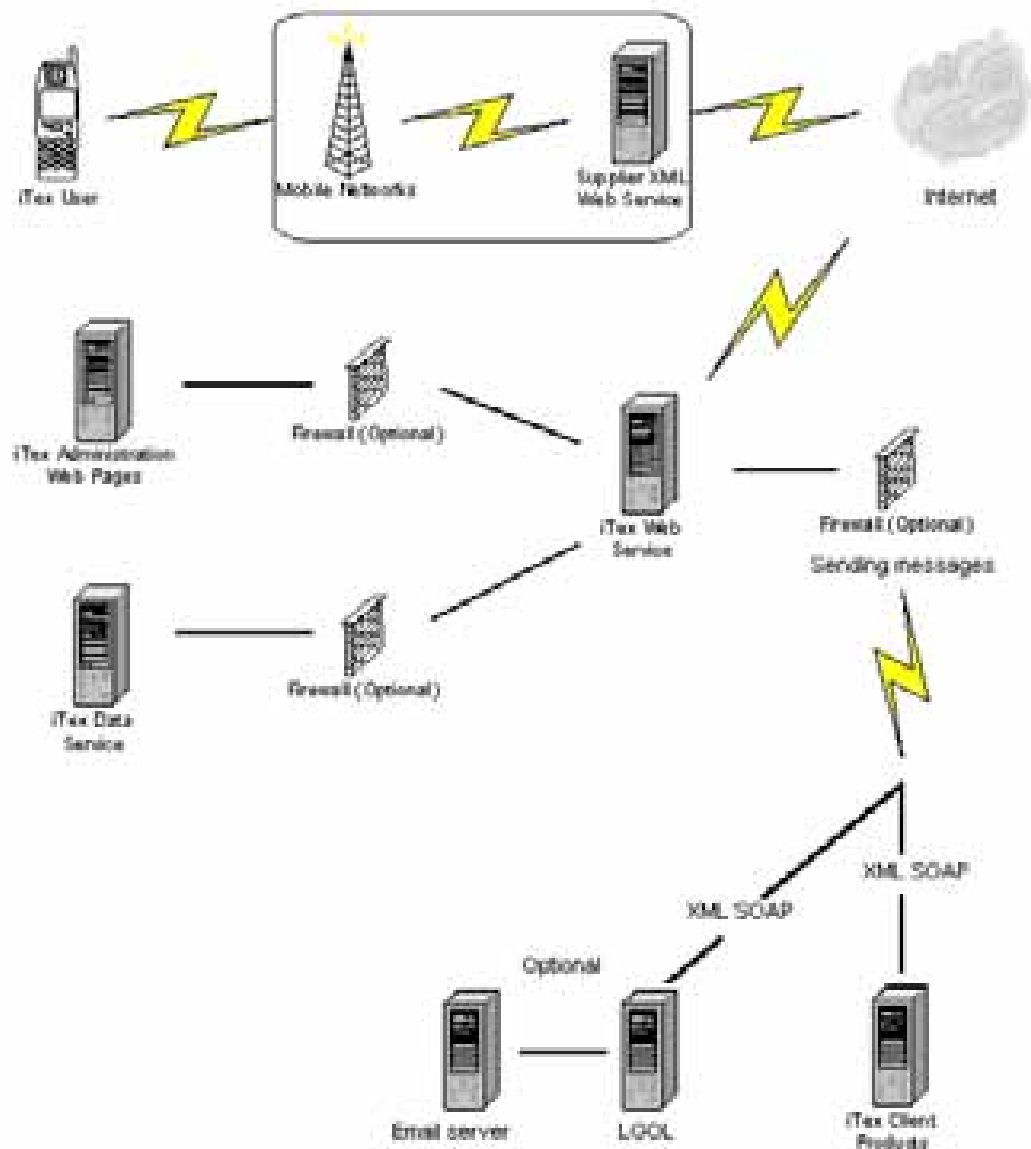
- Intel Pentium 2.8 ghz Server, 512 mb RAM, 80 gb HD
- Microsoft Windows 2000 Server with IIS
- Microsoft .NET Framework
- LGOL-Net Server (optional) with Linux, JBOSS, Tomcat, MySQL, LGOL & Java SDK

3 iTex Components

This chapter provides an overview of the separate components within the iTex system, briefly describing the technical requirements for each component and the functions they each perform. It is divided into the following major sections:

- 3.1 The SMS Service Provider this page
- 3.2 The iTex Web Service page 3-3
- 3.3 The iTex Data service page 3-4
- 3.4 The iTex Admin Service page 3-5
- 3.5 The iTex Client Products page 3-6

3.1 The SMS Service Provider



The SMS Service Provider operates a service to provide access to a mobile phone network. All SMS messages from and to citizens who are registered with your iTex system will be routed to the mobile phone network through the supplier's web-based message handling service.

Any organisation implementing a full iTex system will need to enter into a contract with an SMS Service Provider in order to obtain the link to the mobile phone network. There are a number of different suppliers of such services, and each organisation will need to select the supplier that best meets their requirements.

Most of the large scale network providers are primarily in the business of providing the mobile network, and offer services such as software or internet-based message centres to large volume consumers. However, there are several companies offering message handling services that meet the needs of the iTex system, such as **Esendex**, **Hay Systems** and **Avanquest**.

Kirklees MC chose a company (**Esendex**) that offers an XML web service for handling SMS messages, and also allows viewing of message data through their web portal.

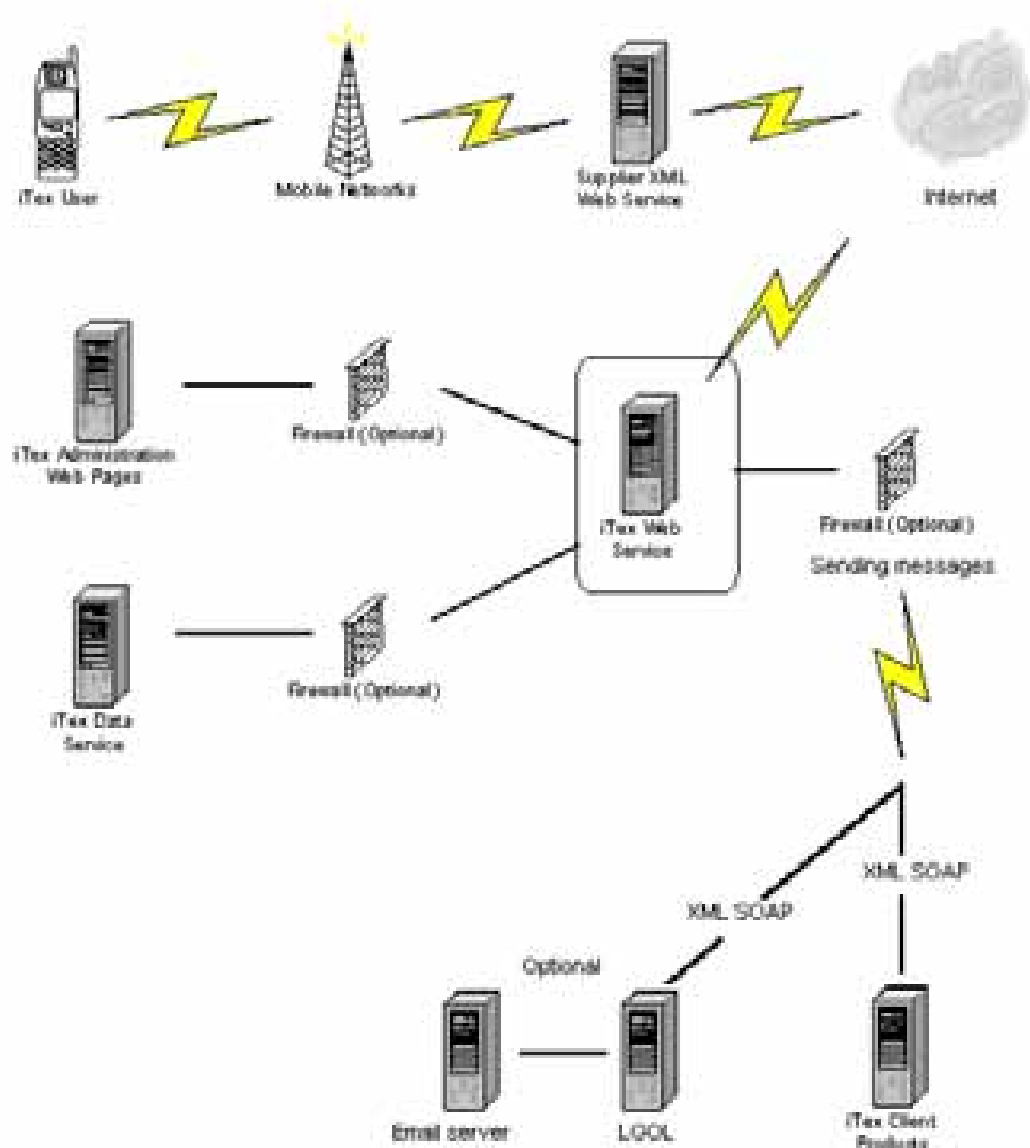
One of the key advantages of using a company such as **Esendex** is that this solution allows the council to exchange data with the service provider over the internet, using secure HTTPS, APIs and XML web services. There is no requirement for additional server or application software within the council for this solution.

iTex was designed around the services offered by the SMS service provider **Esendex**. However, if circumstances dictate that another service provider is used, councils should pay special regard to the following requirements:

- The service provided should be secure and available through the internet.
- XML web services should be preferred, although iTex can manage HTTP: Post.
- Councils can use a middleware product, such as LGOL-Net, to perform message transforms between XML and other message types.

(LGOL-Net is a product of the LAWS National Project, and is available from www.localegovnp.org.uk/laws .)

3.2 The iTex Web Service



The core component of iTex is the Web Service that acts as the hub for all message transactions and administration. The web service accepts XML messages using SOAP (Simple Object Access Protocol) for administration and sending messages.

The web service also routes messages either directly back to the service provider in XML using SOAP, to other web services in XML using SOAP, as URLs using HTTP Post, or as mail messages using SMTP.

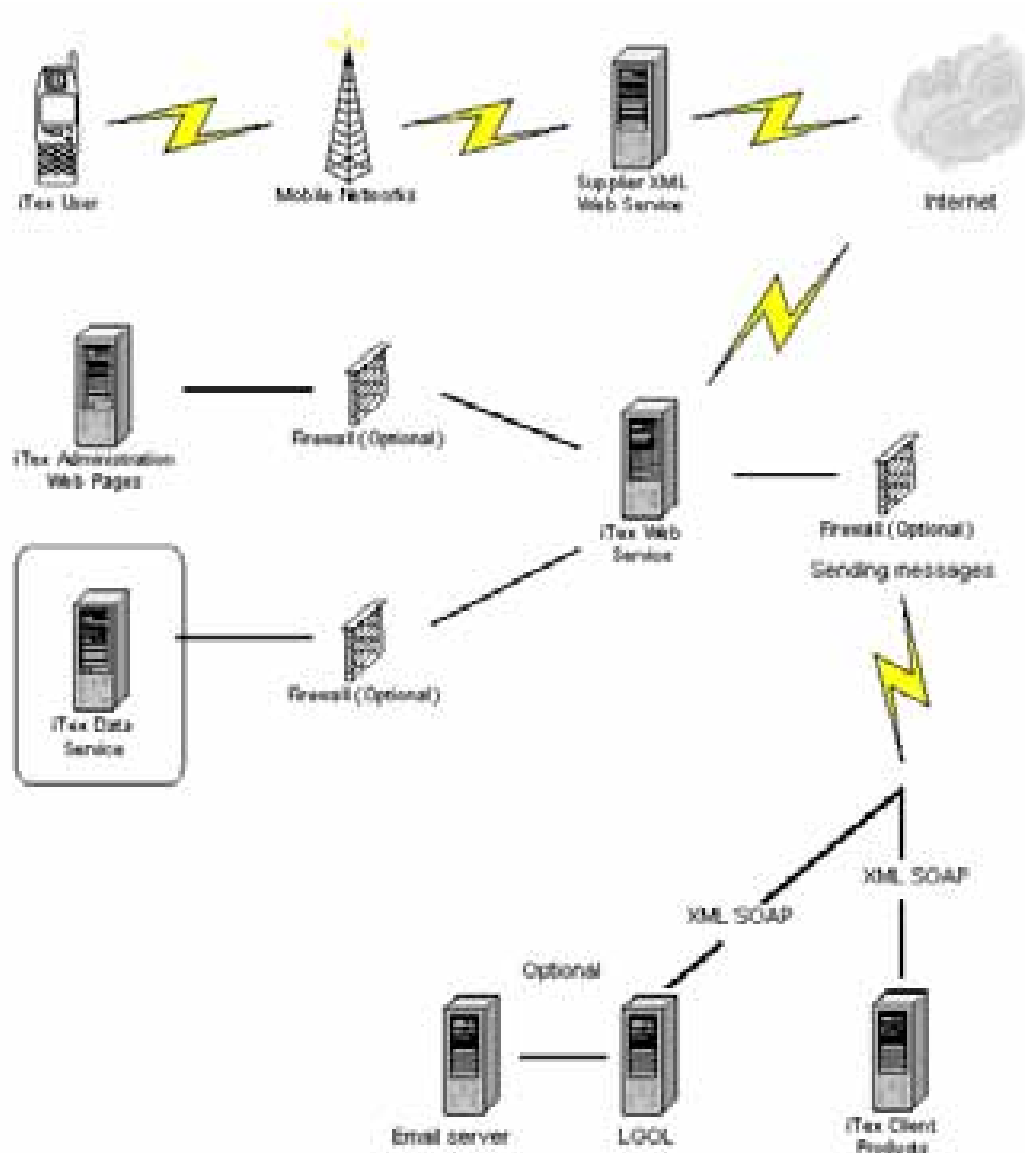
The iTex XML web service contains the majority of the business logic and is exposed (for the purpose of communication with other iTex components) as a series of XML interfaces. The use of secure HTTP (HTTPS) minimises the risk of compromise of the public-facing web server and the data exchanged through it.

The web service has been developed using Microsoft .NET technology and requires a server capable of hosting the .NET framework. Currently this implies that the server needs to be a Microsoft-based server (running Windows 2000/2003 and IIS – Internet Information Services) but the .NET framework will be available

on versions of Linux in the near future. The latest versions of IIS and the .NET framework are available from downloads@microsoft.com.

On a typical iTex installation, the server that hosts the Web Service can also host the web services for the Administration Service and the Client Products.

3.3 The iTex Data service



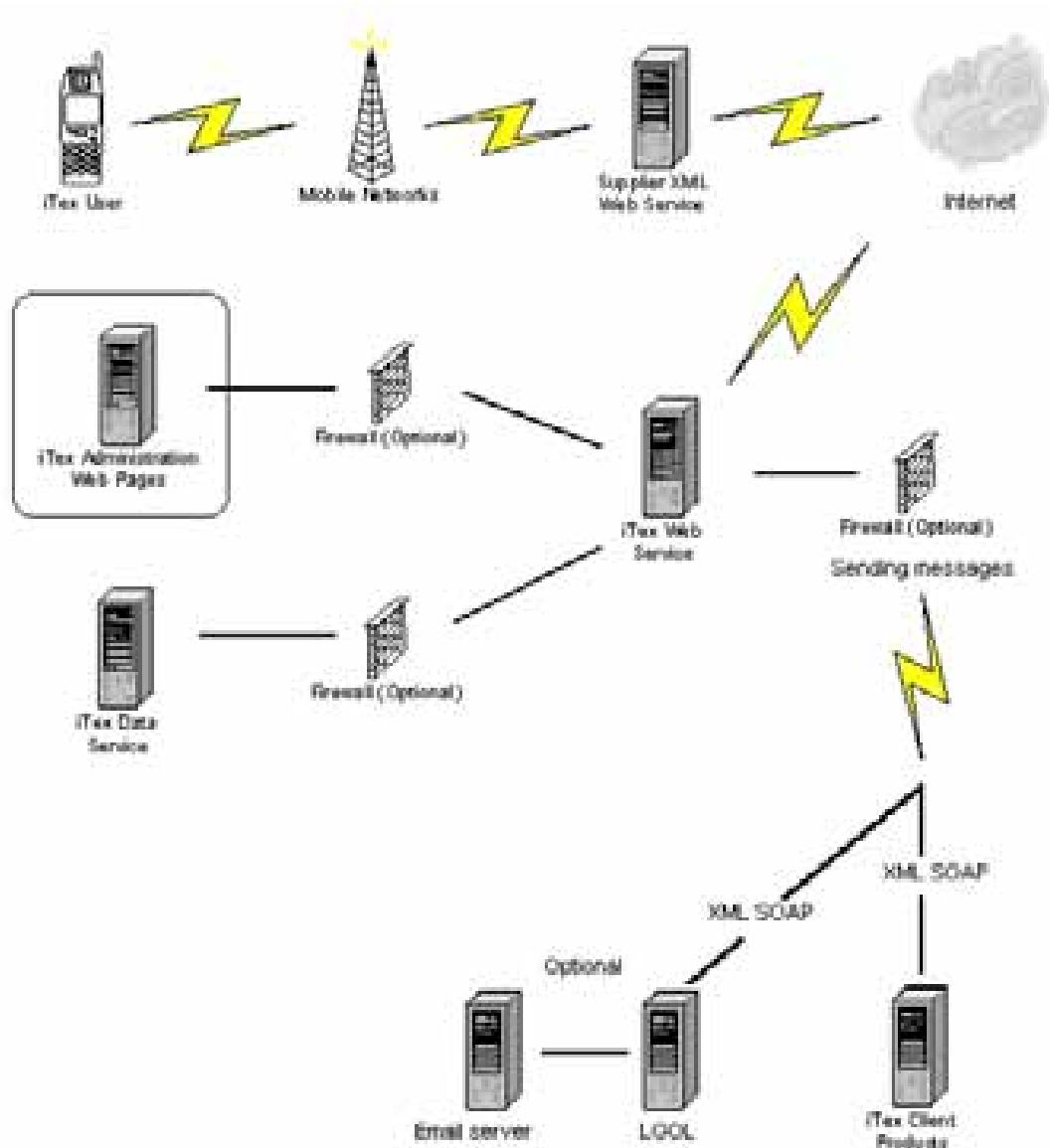
The iTex Web Service stores all messages transactions and administration data, including user names, internal and external accounts, and security details, in the iTex Data Service component.

The data services are provided using a Microsoft SQL Server 2000 database. As with the Web Service server, this implies that the server needs to be Windows 2000/2003, and a license is required for the database software.

The data services component carries out the processing of message data on the server using stored procedures. Therefore it will be possible to provide options for other database products, including open source products, with configurations being handled outside compiled code in a **web config** file.

The infrastructure design allows for data services to be protected by a firewall to minimise the security risk.

3.4 The iTex Admin Service



The iTex Admin Service is provided by the iTex **Administration Web Pages** component. This consists of a set of web pages that interact with the XML web services from the iTex **Web Service** component to provide account and user administration, definition of message handling actions, routing of messages based on keyword identifiers, and a view of message statistics.

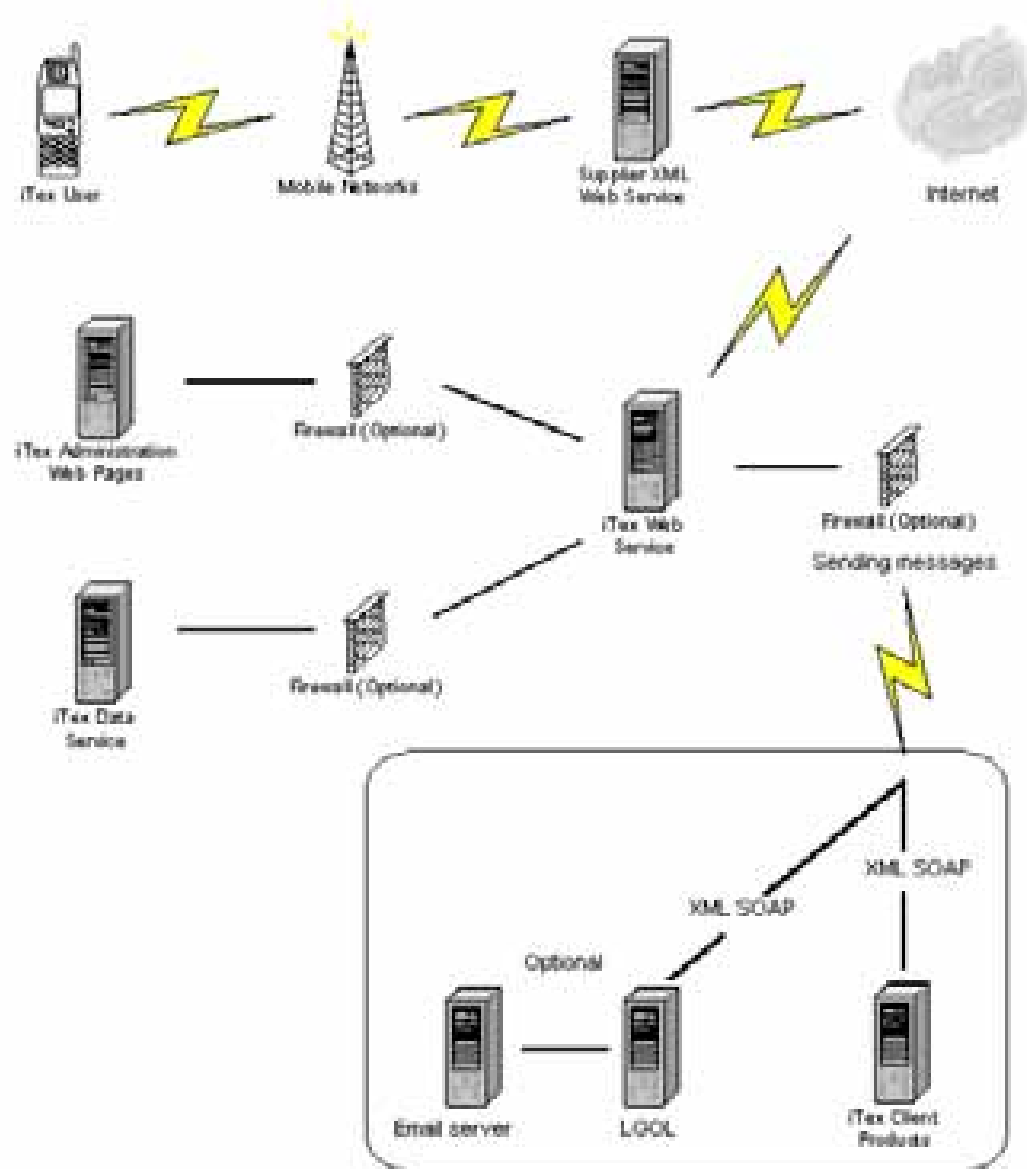
The Admin web pages ‘consume’ the exposed web services, which is to say that administrative activities carried out on the Admin web pages make use of the processing resources provided by the Web Service.

The iTex **Administration Web Pages** can either be located on a separate computer connected to the Web Service via an intranet (as shown in the diagram above), or be published on a public-facing website, if remote access is required. There are no special server requirements for the **Administration Web Pages**, just a computer with the requisite intranet or internet connections.

For security reasons, the **Administration Web Pages** should be protected by a firewall on an intranet, or by secure HTTP (HTTPS) where public facing.

The Admin web pages were developed using Microsoft server side technology.

3.5 The iTex Client Products



The **iTex Client** consists of a series of web pages that allow users to send messages, and manage their own individual contact list. The **iTex Client** consumes the web services provided in the **iTex Web Service**. You can also optionally configure **iTex** to route messages to your organisation's email server, by way of the LGOL-Net server, which transforms, queues and routes messages so that incoming text messages can be received and replied to as emails.

The **iTex Client** pages were developed using Microsoft server side technology, similar to the administration pages.

The infrastructure design allows for client and web applications to be protected by a firewall to separate administrative functions from user functions and minimise the risk of misuse.

4 iTex Messaging Activities

This chapter provides an overview of a number of messaging activities which councils can set up and run using the iTex system. It is divided into the following major sections:

- 4.1 iTex Service Receipts this page
- 4.2 iTex Identifiers page 4-2
- 4.3 iTex PC Messenger page 4-2
- 4.4 iTex Alerts page 4-3
- 4.5 iTex User Registration page 4-3

Refer to Chapter 4 of the **iTex Operation Guide** for an example of how to set up an iTex messaging activity.

4.1 iTex Service Receipts

Service Receipts in general (not just SMS message service receipts) are used to provide the citizen with information relating to a service transaction. For example, if a citizen reports a fault, the service receipt could provide them with a Customer Reference Number to use when enquiring about progress in rectifying that fault.

iTex Service Receipts are just an extension of that principle into the area of SMS messaging between council and citizen.

Each service receipt is a single message to a single registered user. The sending of the message could be triggered automatically, for example from within a Customer Relations Management (CRM) system when the council record on that system details of the relevant service transaction. Alternatively, the service receipt could be initiated manually by a council staff member as a direct response to handling the service transaction.

The iTex system handles both manual and automatic message handling. Within the **iTex Client**, each council staff user of the system can maintain their own contact list, including individual citizens and groups who have a particular interest in common. This allows council staff members to select an individual citizen as the recipient of an SMS message. Meanwhile, the message handling actions defined within the **iTex Admin** service allow automated sending of SMS replies to citizens who have sent the council messages containing particular keywords. Both these methods can be used to send citizens service receipt messages.

4.2 iTex Identifiers

One application for SMS messaging is to send out additional details to citizens in response to a request for more information. Citizens can request information on council activities or services by sending messages containing pre-defined keywords to specific iTex-linked phone numbers. The iTex Web Service identifies the keyword in the citizen's text message and automatically sends them the appropriate return message.

The keywords, the appropriate message handling actions, and the pre-defined return messages all need to be set up in advance, but thereafter this kind of service can be totally automated.

The iTex system allows you to set up default message handling procedures, so that messages from citizens that contain no identifiable keyword can be forwarded (as emails, for example) to a particular council user account. Council staff can then read the citizen's message and send an individual reply, explaining how the use of the relevant keyword is necessary for the system to work.

4.3 iTex PC Messenger

The iTex PC Messenger service links existing email systems with the iTex SMS messaging system. The service is two-way. Council staff members can send emails to the iTex Web Service with a mobile number as the first part of the "To" address. These messages (which must be within the text message 160 character limit, or else they will be truncated to that length) are converted to SMS messages by iTex and sent on to the recipient's mobile number.

Meanwhile, SMS messages sent by citizens to the appropriate iTex-linked phone number will be converted into emails and forwarded to the council user account email address associated with that phone number.

This service can be used as a simple communication method between the council and citizens who have a mobile phone, but no access to email. It can also be used to manage the exchange of messages between a small user group, where the recipients can be contacted either by email, or by SMS message to their mobile phones.

4.4 iTex Alerts

The iTex Alerts service is an application of SMS messaging that allows citizens to sign up for text message alerts in the same way that they can currently sign up for email alerts. For example, a citizen can register to receive an SMS alert every time a new job is posted to the council's vacancies database.

The service is automated, so that the same pre-defined message is sent automatically to everyone who has registered for the service. Obviously, you can set up a number of different registration keywords so that citizens can sign up for alerts relating to different areas of council business: job vacancies, housing availability, events, educational opportunities – whatever there is a demand for.

4.5 iTex User Registration

You may want to set up a general registration service to record details of citizens who are interested in becoming users of the SMS messaging services.

This could be achieved by encouraging people to log on to a registration website and enter their names and mobile phone numbers. However, iTex also offers a simple method of user registration using only the citizens' mobile phones.

The first step is to advertise the number to which citizens should send in their text message registration requests. You define the required registration message, such as texting a keyword followed by the user's first name and last name. For example:

```
register hamish macneil
```

You also need to set up the message handling procedures within iTex to process these registration requests. These procedures could include entering the newly registered user on a database, sending an autoreply message back to the user's mobile phone to thank them for registering, and possibly also sending them a further list of keywords they can text back to request SMS messages relating to specific areas of council business.

