Industry Summary for Communications

iSoftStone Communications Services is comprised of seasoned teams of professionals with deep and industry expertise across specializations in telecommunications equipment, BSS/OSS, support systems, network systems, and multi-media terminals etc. iSoftStone provides clients with a full-range of IT services, including:

- Consulting services and solutions
- Product engineering and R&D
- Testing and localization
- Application development and maintenance
- System integration and conformity
- System operation, maintenance and customization
- Operations supporting systems management

iSoftStone processes will be adapted to meet the clients’ specific needs to guarantee smooth delivery of each project.
Our Strengths

• Experienced Global Service Team

Through our many years of accumulated experience, iSoftStone has built a strong IT service team, including engineers, technicians, and experts with deep industry expertise. They custom design application development systems, solutions and architectures to meet client requirements.
Flexible end-to-end solutions in Communications

iSoftStone's communications solutions cover areas of OSS, BSS, VAS, network systems, embedded and terminal devices design and development, MSS, IT basic architecture, vertical solutions, etc. iSoftStone's accumulated industry and technical expertise through years of servicing global clients is leveraged to provide you the best-of-class customized services in the communications industry.

Additionally, we are also invested in the development of innovative mobile internet applications, such as SNS, mobile search, IM, mobile browser, mobile TV, mobile information securities, mobile mail clients, input methods, mobile cloud, MID device applications, and e-reader etc.. We are dedicated to creating additional end user value and opportunities for future mobile internet applications development.
Network Services & Solutions

iSoftStone provides OSS/BSS/3G/NGN technical support and related services to telecom operators and infrastructure providers. We have built long term strategic partnerships with operators such as China Mobile, China Telecom and China Unicom, and equipment providers, such as Alcatel-Lucent, Ericsson, and Huawei. Through three service delivery centers in Beijing, East China (Shanghai/Nanjing/Wuxi) and South China (Guangzhou/Shenzhen/Hong Kong), iSoftStone is geographically present in 15 large cities around China to deliver multi-location telecom services.

iSoftStone’s services in the communications industry covers four categories to meet the needs of telecom operators, equipment manufacturers, and service providers’ demands on business development and operational management.

- OSS/BSS
- Mobile & Embedded System Service
- 3G/4G/IMS/SDP/Broadband
- The Internet of Things & Cloud Computing
OSS/BSS

iSoftStone's long term experience in BOSS software R&D and implementation spans across different business domains, implementation processes, implementation environment and technical capabilities. iSoftStone's BOSS software service covers consulting, planning, design, implementation, testing, technical support and maintenance.

VAS/SDP

Providing end-to-end software engineering services, including SMS, MMS, WAP, LBS, Mobile Internet, Multimedia application and vertical mobile applications.

3G/4G

As the telecom networks are continuously upgrading and merging, iSoftStone focused on R&D innovation and developed a series 3G/4G network application and equipment solutions with world-renowned partners. iSoftStone is not only integral to the existing upgrade of telecom networks, we also assist clients with R&D and implementation of the Next Generation Intelligence Network.

IMS

The focus of the modern telecom industry has shifted from providing communication services to providing data services. IP based multimedia technologies bring many new opportunities and challenges in supporting the network. iSoftStone is not only assisting domestic manufacturers develop intelligent and effective multimedia gateway products, but we are also designing wireless multimedia gateway solutions and family base station solution for home users.
iSoftStone is dedicating infrastructure engineers and resources to the mobile internet initiative and committed to providing full-scale services such as forward-looking R&D and prototype testing, technical support for cross-platform adaption of smart terminals etc., for telecom operators like China Mobile, China Telecom. iSoftStone has established multiple R&D and implementation teams in different cities (Beijing, Shanghai, Shenzhen, Wuhan, and Nanjing etc.). The cost of development and promotion of innovative products is reduced tremendously through high performance IT services, which can help customers face challenges from the furious growth of mobile internet calmly.

We also developed a series of advanced industry solutions through independent R&D and successful accumulation of our professional services experience:

- Embedded Devices
- Rich-Media Application
- Mobile Cloud Services

With our experienced R&D teams and advance industry solutions, iSoftStone is committed to providing full mobile internet services and becomes a key driver in the mobile industry.
Embedded Devices

iSoftStone is the leading service provider for embedded communications networks. Through assisting our world-class embedded terminal devices customers in R&D, we have built a top talent pool in this domain. From access networks to core networks, from transmission networks to service networks, we are able to assist our customers with overall R&D (including hardware, driver, protocols, platform, and embedded applications etc.) on Android, BREW, Windows CE & Mobile, iPhone, Symbian, Linux & J2ME.

Rich-Media Application

With the 3G network deployment and increasing popularity of mobile devices, mobile has become a new medium to communicate rich images, text and video content, and cater to the continuous needs of wireless entertainment. Based on our experience with mobile applications and multimedia technologies, iSoftStone has built a mobile rich-media application solution, which includes various information processing and presentation of image, text or video. Adopting the integrated model of C/S and B/S, the solution makes full use of the mobile screen to present colorful multimedia contents, such as animations, and news etc.

Mobile Cloud Services

In the era of the mobile internet, operators and equipment manufacturers have transformed from providing basic network services and wireless smart devices to providing mobile value added services. iSoftStone’s mobile cloud solution provides end to end services, including cloud infrastructure design, cloud services implementation, system maintenance, terminal customization, client side value added services development. We also help customers with design, implementation, deployment, and maintenance. We are committed to assisting customers in bringing brand new user experiences through the integration of multiple services (SNS, IM, and streaming media entertainment service etc.), exploring and discovering large opportunities leveraging the mobile internet.
iSoftStone Industry Solution
Embedded Device Solution

Target Customers
- Telecom operators, Radio and Television Operators
- Telecom/Radio and Television Equipment Manufacturers
- Chip Manufacturers
- Industry Solution providers
- Mobile Value Add Service Providers

Industries
- Telecom
- Radio and Television
- Security Surveillance
- Consumers

Customer Challenges
With the growing development of mobile internet and the trend of tri-network convergence, the business model is transforming from traditional voice-based services to innovative data-based services in the telecom industry. Represented by smart phones and tablet PCs, innovative internet surfing devices and numerous mobile applications are significantly promoting the development of the trend.

The ability to develop and publish mobile internet devices and applications conveniently and quickly in the face of growing competition has become the focus of telecom operators and application providers.

The research, development and manufacturing of embedded devices have a high technology barrier of entry. It is a mandate from the market that a mobile device solution can implement the customers' ideas rapidly.

iSoftStone has been involved in the design and development of embedded devices since founding in 2001. Our many years of technology experience plus a strategic bet on the market development culminated in the development of 'IMOBOT', an Android-based embedded solution. 'IMOBOT' is a general solution with an integrated basic hardware environment and software development platform. Not only is it regarded as the reference board for the purpose of prototype verification, but it is also a standard hardware platform for mobile application development.

Application base on Internet
- Web browser, e-Mail, Push Mail, Searching, IM
- VoIP Communication: IP Phone, IP Video Phone, Push to Talk
- Entertainment: Internet Radio, Internet TV, Internet Media Sharing, Internet Magazine

Supported Services
- Reference board design: Adhering to a specific chip and detailed requirements, design hardware for reference board, and provide a reference board prototype.
- Total production embedded solution: Adhering to hardware and application requirements, provide comprehensive services from hardware design to application development, and deliver end devices to customers.
- Embedded hardware ODM: Adhering to customer requirements, complete the development from hardware design, software development to preparation for manufacturing, even mass production if necessary.
- Industry solution: Adhering to industry specific requirements, provide consulting on all aspects in this field and implement a total solution from design and development of hardware and software to deployment.

This solution is able to meet the full range of requirements from customers, such as embedded hardware design, mobile application development etc. Based on 'IMOBOT', iSoftStone is able to provide comprehensive services in the embedded industry for a multitude of customers.
Embedded Device Solution

1. Reference Board Design for Telecom-class IP Video Phone

Based on the Android platform, the device is extended and modified according to the requirements of tri-network convergence.

- **BSP**: Ethernet, USB, WiFi, ALSA, file system and etc.
- **Display Sub System**: V4L2 Camera and V4L2 Display, Overlay System, Overlay hardware abstract layer, Camera interface, Camera abstract layer, Connection between camera and overlay system.
- **Media sub system**: Audio-related interfaces in media library, audio system top layer interface, audio hardware abstract layer, connection between audio system and drivers, core media library, Framework multimedia module, Video System, integration of hardware encoders and decoders in video system.
- **Communication Sub System**: PSTN Phone, Mobile Phone, SIP Protocol stacks, IP Video Phone.

2. Community Video Intercom System

- **Application Server for Video Intercom Hub**
  
  Linux based, the modules were designed as independent components. The SDK includes rich APIs to enable further client customization. Each software component can be loaded as needed. The hardware can either a general server or a high performance, high stability and low power consumption solution such PowerPC.

- **Video Intercom Client Platform**
  
  Our ‘MOBOT’ platform can interop with most popular IP Phone/video phone client/soft terminal and GK/SIP server. It can be used to develop video intercom clients with high video and audio quality.

3. Broadcasting Television Set-Top Box Prototype

This device is a duplex, multi-mode intelligent set-top box, compatible with standard-definition and HD. The purpose of this device is to provide a low cost and high performance terminal product solution for the upgrade of standard-definition and HD operation of all the NGB network duplex services.

Based on Android 2.3, we added key extensions and optimization specific for broadcasting television applications. The broadcasting television customization layer provides a unified software framework, unified application interfaces and simulated environment for application developers.

This box supports two channels 1080p digital television TS stream multiplexing, (simultaneous watching and recording), operations of internet TV, including broadcasting AVOD / play, local browsing and play, local album and online album, media content share, flash games, Java games, and 2D/3D online games.

4. Full-Path Recognition Intelligent Transport System

The system is composed of two parts:

- **Card Terminal**: Mobile card terminal with multi-components, such as contactless IC card, wireless module, battery module and etc.
- **Backend Management System**: Fulfill intelligent transport management by processing location data from LBS platform of telecom operators.

![Diagram of Full-Path Recognition Intelligent Transport System]

**System Functions:**

A. Full-Path Recognition
B. Exception Management
C. Warning Management
D. Traffic Monitoring
E. Statistical Analysis
F. Flexible System Configuration

iSoftStone is a leader in Android-based smart terminal solutions. With the future diversification of consumer electronics, we will develop commercial ODM customizations and SDKs for various types of products and CPU platforms.
Target Customers

- Transportation Departments
- Mobile Telecom Operators

Industry

- Transportation

Customer Challenges

With the bursting development of highways in recent years and the development plan of highway networks published in 2005, the basic network of national highways will be established in 2020 and the total length of highways in China will be 100,000km. The Ministry of Transportation is targeting a zero-waiting toll collection network. At present, most provinces have already completed implementation or are in the process of implementation. The current implementation charges only by the shortest path from entry to exit.

With the continuing construction of highways, many issues have been raised, such as path ambiguity, toll evasion, toll loss, toll allocating etc.

Intelligent Transport System enables full-path recognition of a vehicle on highways and length-based toll collection based on LBS technology. This solution resolves all of the above issues raised regarding a fully automated toll collection system. Based on advanced technology, we are able to enable a fully-controlled intelligent transport scheduler and rescue system and comprehensive intelligent transport infrastructure, resulting in significant economic and social benefits.

System Architecture

The full-path recognition system is composed of two parts:

- **Card Terminal**: Mobile card terminal with multiple components, such as contactless IC card, wireless module, battery module and etc.
- **Backend Management System**: Enables intelligent transport management by processing location data from LBS platform of telecom operators.

Features of the Full-Path Recognition System

- RFID-based mobile terminal technology, requires minimal modification of existing management and operations processes, and compatible with current toll collection system
- Supports contactless IC Cards, requires minimal modification of existing toll collection systems
- Automatic monitoring of a vehicle’s full path
- High accuracy and reliability of location data based from full-path recognition can be leveraged for emergency rescue information support and evidence for toll collection inspection
- Flexible, accurate statistical analysis and data mining
Full-Path Recognition Intelligent Transport System

System Functions:
A. Full-Path Recognition
B. Exception Management
C. Warning Management
D. Traffic Monitoring
E. Statistical Analysis
F. Flexible System Configuration

System Work Flow

1) When vehicle is pulling in, toll station issues a card terminal.
2) The full-path of the vehicle is recorded on the card terminal and location information is retrieved real-time through LBS and identifier of base station.
3) The system is able to monitor the Full-Paths of selected vehicles using real-time location data from LBS. Additional functions, such as real-time monitoring, traffic monitoring, emergency rescue and intelligent schedule, are provided by this system as well. The data can also be used as receipt for tolls and toll allocating.
4) At the exit tolls, the toll station is able to charge accurately based on retrieving key points data from the archived full-path.

The system can meet the requirements of true path tolls and accurate allocating through two different methods of identifying the full-path of a vehicle—LBS and base station identifier.

Economic Benefits

Through the integration of full-path recognition intelligent transport system with the existing transportation administration system, highway administration units are able to eliminate the revenue loss resulting from toll evasion and inaccurate tolls. Toll revenue of a mid-scale province is about 3~4 million RMB. According to informal statistics, the loss from toll evasion is about 5%~10%. The successful deployment of this system will have significant economic impact.

The allocating and settlement of tolls will become more convenient with precise recording of a vehicle’s path. Negative impacts from ambiguous modeling and volume analysis workload will be reduced greatly. Through the integration of this system with existing transport administration systems, the level of highway management has improved noticeably and management costs are significantly reduced.

Social Benefits

Not only does the system record the full path of a vehicle, but it also provides warning functionality based on precise location information. The efficiency of warning processing is improved dramatically. Both potential secondary hazards and loss of public life and properties can be reduced.
Mobile Cloud Services Solution

Target Customers

Internet Service Providers
Mobile Device Manufacturers
Mobile Service Providers
Mobile Carriers

Cloud Computing is The Future

With the continuing development of the communications technologies, computing technology is experiencing the transformation from personal computing to intensive computing. “Cloud Computing” has gained popularity. As extension of personal computing, Cloud computing provides more possibilities for service consumption and provision. In recent years, there has been significant growth in the development of cloud computing platforms and design of consumer terminal devices.

The cutting-edge cloud-based consumer terminal devices such as smart handsets and tablet PC, have become fashionable must-have’s. In China and other Asian markets, the market share of smart phone has been continuously increasing. On the other hand, traditional low-end feature phone will retire gradually. China mobile device manufacturers can ship Android-based smart phones for under $200.00. According to informal statistics, the market share of Android-based handsets has increased dramatically in China from 0.4% in 2008 to 14.3% in 2010.

With the improvement of 3G network services, China is experiencing the industrial transformation brought on by the flourishing development of mobile internet technologies. From the telecom operators’ point of view, the mobile internet industry has started a transition towards new business models. Traditional voice service can no longer satisfy the market demands. The way to establish a competitive edge has become an important topic from the perspective of the telecom operators. The era of selling terminals only has passed. Devices plus cloud services has become the inevitable path for competitive differentiation against international competitors.

Since 2008, iSoftStone has invested significant resources in mobile internet technologies. Now, we have sizable R&D and implementation teams in many locations, such as Beijing, Shanghai, Shenzhen, Nanjing and etc. We have developed a series of advanced industry solutions, including industry specific mobile applications, IM, and mobile gaming on top mobile OS’s (Android, Symbian, iPhone...) etc. We also partner with our clients to build out and maintain mobile cloud infrastructures.

iSoftStone mobile cloud solution is an Android-based solution for the development of value added services and platform maintenance through many years of technical accumulation. The cloud side of the solution implements a series of operational functions (provisioning, management and billing) for various services, such as SNS, IM, streaming media etc.

Not only are the devices heavily customized, but it also integrates user preferences related to their usage behavior and popular applications, which improve user experiences dramatically.

Through the perfect integration of cloud management and end-user presentation, iSoftStone provides advanced mobile internet solutions that offer in depth support for business creation and rapid domination of market.
Mobile Cloud Services Solution

Case Study

Customer Background
A communications products focused enterprise, the customer is a Chinese technology company specializing in the R&D and manufacture of mobile handsets. In the first quarter of 2010, it became one of the top 10 manufacturers of mobile handsets worldwide. The customer exports to more than 30 countries such as Middle East, and India etc., with millions of oversea shipments every month.

Customer Challenges
The past success of this customer is mainly a result of the popularization of its mid and bottom tier handsets. It is very difficult currently for the customer to compete against other manufacturers in the global markets with its bottom tier focused branding. They hope to promote their high-end handsets with cloud services in the China market, and leverage the success in China to build a new brand in the global markets.

The customer wants to build a consolidated cloud-based system to support the promotion and operation of its various pre-installed services, and deliver a rich user experience to its global mobile users. To support this goal, the customer needs an experienced team to help them on both handset OS customization and cloud platform design, build out and operation.

iSoftStone Mobile Cloud Solution
iSoftStone Mobile Cloud Solution includes both IT service and consulting service.

IT Services:
A. Mobile cloud infrastructure build out and management
B. Mobile client development: UI design, UX design, Android platform customization.

Consulting Services:
A. Operations and maintenance of mobile value added services
B. The design, implementation and deployment of the cloud architecture.
C. User Experience
D. The construction and operations of the e-market business mode

iSoftStone Mobile Cloud Solution provides end to end services, including solution design, software development, implementation, deployment and operations. We also assist the customer with the implementation of the cloud services for the Android platform and ramping up large-scale operations quickly.

iSoftStone mobile internet know-how and its developed mobile cloud solutions exactly satisfy the customers’ requirements about setting up the new brand image and dominating the market by quickly developing cloud service, and also fill in the gap for the customers in terms of accumulation of Android low-level research and development technology with the professional and top-quality service.
Rich-Media Application Solution

Target Customers

- Telecom Operators
- Advertisers

Mobile Multimedia Opportunities and Challenges

With the increasing popularity of smart phones, improvement of network infrastructure services, such as 3G network, CMMB etc, the traditional mobile value add service model is impacted by mobile multimedia services which delivers divers content presentation and an intuitive user experience. In China, mobile multimedia services have become critical in the competition of among telecom operators. By publishing their own mobile video clients and services, many video websites not only develop additional revenue streams for themselves, but are also providing additional video content and service options for end users.

Background:

1) China Mobile(HK.0941) established an Innovation Center for mobile video products in Shanghai. A total of 31 billion RMB will be invested in the first three years. It is predicted that in 2010 the number of video users would be over 10 million.

2) China Telecom (0728. HK) established “e surfing” Video Base in Shanghai. At present, there are about 1 million paid users on its mobile client, 2 million users on PC clients and 10 million paid users on other devices.

As a new delivery mechanism for multimedia services, mobile’s portability eliminates the constraints from timing and disk space. From the content perspective, multimedia services are now more timely, vivid, and realistic on the new platform; from the perspective of content sources, mobile multimedia turns traditional unidirectional communication upside down. Everyone can become a producer and a publisher.

Even though development has been rapid, mobile devices still have their own limits, such as small screen size and CPU performance. It is difficult to present much richer multimedia content. The sheer number of handset models and diversity in mobile platforms also present a major challenge.

iSoftStone Rich-Media Application Solution

Two architecture models are utilized:

- C/S (Client/Server) Model:
  - Strength: Easy to implement expected functionality and special effects; the only limitations are a result of development tool capabilities or low-level functionalities in the OS.
  - Weakness: Most functionality updates, UI modifications, and logical changes require a client upgrade.

- B/S(Browser/Server) Model:
  - Strength: Easy to implement business logic, dynamic content and UI.
  - Weakness: Due browser and tag limitations, many special effects cannot be implemented through the browser.

Our many years of experience with mobile applications and multimedia technologies have culminated in iSoftStone’s development of the Rich-Media Application Solution. The solution integrates both the C/S and B/S models, which allows presentation of diverse multimedia content by merging the strengths of both architecture models.

Characteristics and Strengths

Not only does the solution make full use of all the technical advantages, such as the C/S framework, machine state management, special effects, client upgrade, communication filter etc., but it also takes advantage of the B/S architecture capabilities such as scenes and script parsing, taking over server side pages etc. By integrating the two models, the solution creates a perfect model which is able to adapt to various handset models smoothly with user friendly UIs.
Rich-Media Application Solution

Case Study
China Telecom 'e surfing' Video Service Center Project

- Third party libraries
  The third party libraries are designed for the application layer, which implements the effects that WAP are incapable of making. The service extensions are supported by dynamic library upgrades.

• 'e surfing' Video Client Core Engine
  This engine is designed with the C/S architecture with separate state machines, data transfer services, and local scene parsing module.
  It also renders UI efficiently by leveraging the system browser and parsing data packets from the server side. The graphics engine is used to finish UI rendering. According to various requirements, dynamic extensions are implemented using third party libraries.

• Communication Module
  This module provides client communication services which establish interaction by creating the server connection, which transmits data to the clients.

• Scene and Script Parsing Engine
  The parsing engine is core to rich-media functionality and completes the parsing layer functionality. It implements client side business logic and page presentation by completing scene parsing and script calls.

• Graphics and UI Engine
  The graphics engine is designed for the presentation layer, which promotes user experience through graphics processing and effective rendering.
Key Client

Microsoft  IBM  Ericsson  Sony Ericsson

中国移动通信  China Telecom  China Unicom 中国联通

SK telecom  BT  Huawei  Lenovo

Nokia Siemens Networks  Huawei Symantec  ASP 卓望科技  TD Tech

KPN  AsiaInfo Linkage  France Telecom  China Satcom  GT Mobile