

CASE STUDY DOCUMENT

ON

PRODUCT UPGRADATION SERVICES

By

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Case Study 1: Feature / performance Upgradation

Introduction

Customer wanted us to develop their product range for home security market.

Need of this project

Home security market is large in size. Today, there is great demand for advance, interactive and user-friendly security systems. Our client wanted to capture this market segment by developing such security system. They wanted to outsource this development to Indian company for two reasons

- Cost effectiveness
- Unavailability of in-house development resources

Our Role

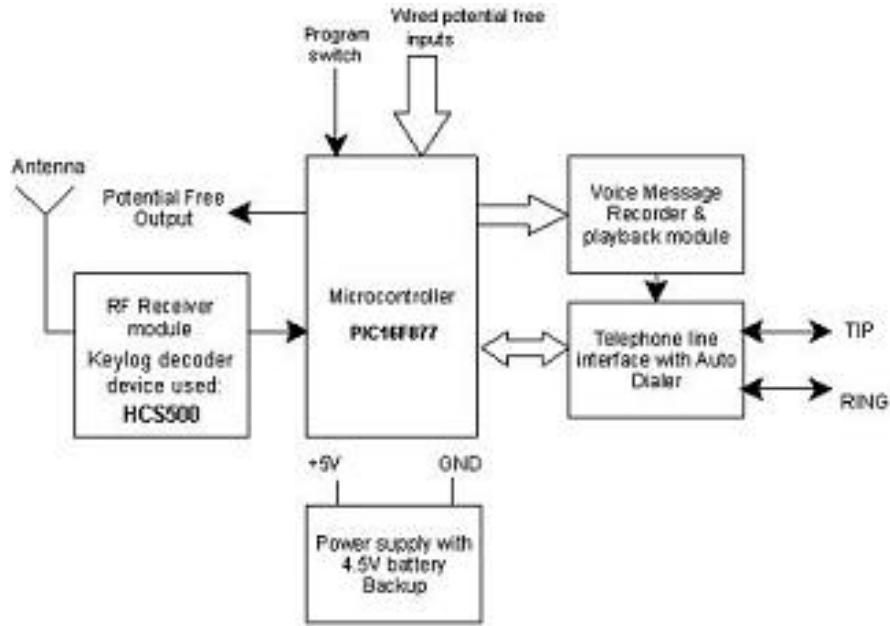
We have 5 years of experience in security and surveillance domain. We have worked on the projects like home security controller, automatic gate controllers, auto dialers, fire panels, audio and video surveillance etc.

Our end-to-end service offerings:

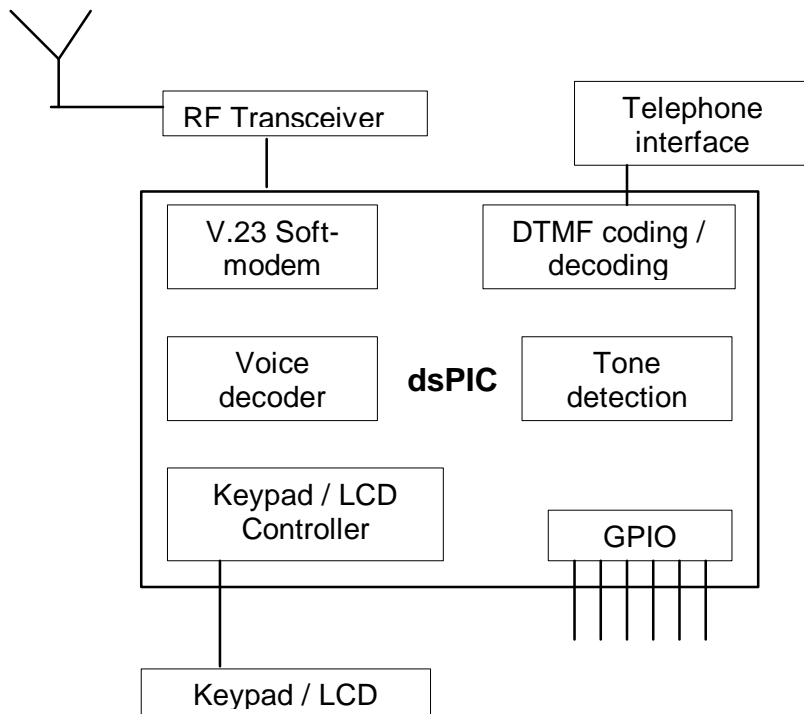
- Hardware development.
- Firmware development.
- PC side application development.
- System Integration.
- Engineering design.



Solution:



Above figure indicates block diagram of old system. This was based on PIC 16F877. Older microcontroller was not having DSP functionality. Functions like DTMF coding decoding, voice decoding has to be implemented with dedicated chips.



Above figure indicates block diagram of new system. There is a main dsPIC processor, which we call it as a system controller. Various sensors are connected to I/Os of system controller. When any sensor gives the trigger to system



controller, it connects to the central monitoring system (CMS) where all the user details are stored, and displays the information of the user. It can also dial pre-stored phone numbers.

Key Features of the system:

- User friendliness.
- Interactiveness
- Web connectivity.
- Telephone auto dialing
- Remote programming.
- Wired / wireless sensors.
- Detailed reporting to CMS.

dsPIC has library components for the hardware peripherals. We built our application on top of the library components. We soft-implemented DTMF coding decoding, V.23 soft-modem, carrier frequency tone detection, voice decoding and other related communication protocols.

Features of dsPIC family:

- High-Performance DSC CPU
- 8-channel hardware DMA:
- Up to 85 programmable digital I/O pins
- Flash program memory, up to 256 Kbytes
- Timer/Counters, up to nine 16-bit timers:
- 3-wire SPI
- I2C
- UART
- Enhanced CAN
- On chip ADC



Case Study 2: Form Factor Upgradation

Introduction:

Form Factor upgradation can be defined as “Any type of updations in physical dimensions of the product”. It is not only in the form of size reduction, but also can be reduction in weight, better shape / look and feel and improvement in the user friendliness

It can be achieved in following ways

- Increasing the PCB layers
- Decreasing the chip count
- Designing the better enclosures
- Using smaller components

Need of this project

Our client was having one legacy product called as “serial to Ethernet converter”. They wanted very small shaped RS-232 (TTL level) to Ethernet converter module, which will be mounted on a PCB.

Solution:

Previous serial to Ethernet converter was developed on Atmel's ATMega168 controller. In new design we kept the controller same as the older one. We increased the number of layers from 2 to 4. We reduced certain chips like MAX 232. Hence we could able to reduce the size of PCB by 70 %. But basic functionality, performance, reliability of the system was maintained.

Our Role

- Analyzing the customers requirements
- Designing the new board as per the customers requirements
- Developing the prototype board
- Testing



Case Study 3: Reduction of Hazardous Substance (RoHS) compliance

Introduction:

From July '06, European union has made the RoHS standard compulsory for the products, which will be shipped across the Europe. This standard prohibits the use of components using Pb. So most of the hardware manufacturers are porting the old boards to RoHS compliant boards.

Need of this project

One of our clients was having non-RoHS compliant microcontroller programmer board. Before the end date for RoHS norm, they wanted to develop the compliant board.

Solution:

For every old part number, new ROHS compliant part number was selected and fresh bill of material was generated. Few parts like Diode Protection Array were not having equivalent ROHS component, matching the footprint. So new component was selected and PCB design was modified. The new PCB was fabricated and tested as per original test plan

Our Role

- Finding out the non-compliant components.
- Finding out the replacement for those.
- Preparing the circuit schematic with the new parts
- Preparing the layout
- Fabricating and assembling the board



Case Study 4: Replacing “End Of Life Cycle (EoL)” components.

Introduction:

Because of EoL of a component used in the product, manufacturer wanted to replace it. Due to availability of better component from a different manufacturer, we decided to replace with it.

Need of this project

One of our customers, working in automotive electronics, received the EoL notice from “ST Semiconductors” after nearly 10 years of existence of their microcontroller. Main aim was to replace the controller, keeping old product design, form factor, PCB size, outer enclosures same as older one.

Solution

We migrated from ST’s 8-bit ST62T42BQ6 to microchip’s 8-bit PIC 16F946 controller. We added some more features also. ST62T42BQ6 was OTP (One time Programmable) type. PIC 16F946 is multi time programmable chip. We took out the ICSP pins for IC reprogramming. Both ICs being 64 pins, we could maintain compatibility between the circuits.

Our Role

- Finding out the new controller compatible to older one.
- Build the new circuit.
- Porting of the firmware.
- Compatibility testing with other old components, software etc