



Soil Health Card Project

Overview

The Soil Health Card System is a web based information system providing a common service platform for **Government-to-Citizen (G2C)** and **Government-to-Government (G2G)** kind of services in the field of agriculture. It is designed to run on a complex networked environment comprising of **Internet** and **intranet** in the form of GSWAN (Gujarat State Wide Area Network) spanning across the entire state of Gujarat. This is a repository of agricultural information for the benefit of farmers, agricultural scientists and decision makers at Government level.

In India, there is enormous amount of agricultural information available with the scientific community restricted to the labs and research stations across the Agricultural Universities. The farmers can get benefited, if this scientific agricultural information is made available to them and is used practically in the crop fields. The Soil Health Card System brings together the scientific community in the field of agriculture, the information repository of latest tools, techniques & cropping practices, the farmers and the Government for the economic upliftment of the people at large.

Using the G2C interface of SHC application, any farmer of Gujarat can generate an individual Soil Health Card for his/her plot or a generic Village Soil Health Card with details about the land condition and fertilizer requirements for the various crops being grown in his Taluka. This interface also facilitates the farmers to get direct advice from Agricultural scientists regarding alternative crops / cropping patterns based on their Soil Analysis Report and Moisture Index, fertilizer usage and the crop practices from sowing to harvesting for various crops in his region. He can also pose questions or view solutions for the questions asked by other farmers on different topics like seed treatments, irrigation, pests and diseases, weed control, weather conditions and forecasts etc. using this interface.

The G2G interface, on the other hand provides a mechanism for the Government officials to insert, update, retrieve different data for building and maintaining an up-to-date agricultural database for the benefit of the farmers. They can generate various analytical and statistical reports for decision-making. It also helps the officials at various levels and locations including Village, Taluka, District, Secretariat and Universities to share the vital information on agricultural resources and other departmental activities like schemes, educational programmes, funds and facilities, weather, land usage etc. for building up the action plan.

Thus Soil Health Card System is a unique **e-Governance** initiative of its kind in India pioneered & initiated by the Government of Gujarat for the benefit of farmers at the grass-root level. It has following noble objectives.

Objectives



- Direct & timely advice / guidance to farmers
- Linkage of Administrators–Scientist–Extension Officials–Farmers on common platform
- Better Knowledge Utilization
- Better Crop quality and yield
- Distribution of Soil Health Card to farmers
- Enhancement of Income of Farmers

The following paragraphs describe various aspects of the SHC System in brief.

Features

- Web-based three-tiered architecture.
- Integrated solution for Web Site and Web application.
- Bilingual operations in English and Gujarati for Web Sites.
- Web application purely in Gujarati for the benefit of the farmers.
- Distributed data entry and processing capabilities.
- Parameter-based and rule-based decision logic.
- Central control and monitoring system.
- Role-based access to all the internal users.
- Open access to the farmers and external users to view recommendations.
- Intelligent workflow management.
- Auto generated built-in alerts and alarms.
- Fast and flawless retrieval of data
- User friendly operations
- Easily scalable, expandable and configurable

Functionality

- ✓ Master data entry for Districts, Taluka, Village, Farmers, Crops & Crops related details, parameters, labs, offices and users.
- ✓ Entry and modification of the Soil Health Card data.
- ✓ Processing of various transaction data for soil, weather, fertilizers, profitability etc. For generating various reports and recommendations
- ✓ Generation of recommendation of the fertilizers needed for a particular crop based on a nutrition status of farmer's soil.



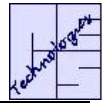
Soil Health Card

- ✓ Generation of recommendation of the alternative Crops to a farmer for better crop production based on his cropping practice and weather condition in his area considering the facts like MAI, AWC & LGP.
- ✓ Generation of recommendation of the alternative Crops with a generic ranking of crops in terms of profitability, looking into the various costs involved for producing that crop.
- ✓ Generation of the State wise, district wise and Taluka wise plans and entry, correction & modification of various action-plan related data.
- ✓ Generation of various types of reports both textual & graphical.
- ✓ Building up a categorised databank of frequently asked questions (FAQs) on different topics and problems and their solutions as given by the respective agricultural scientists.

Road-map

The project is completed and the client is using the system in full swing. The following points list out the various milestones achieved during the project cycle.

- Award of contract
- Inception report
- User Requirement Study Report
- System Requirement Specification
- Pilot project
- Data collection, validation and entry (in collaboration with client)
- Database design, generation and population by importing the formatted data.
- Application Software Design, Development, Testing, Debugging (SDLC)
- Hardware installation & network set up
- System Integration
- Implementation of Application Software
- Application Software Acceptance by technical committee of the client
- User Trainings
- Administrator Trainings
- Quality Testing by EQDC
- Release of the system to the users (Go-Live)
- Hand-holding and FM support
- Warranty support



System Architecture

The Soil Health Card system is an integrated web-based system comprising of website and web application. The website includes the individual site for the four Agricultural Universities and the Department of Agriculture. These web sites and web application reside on the web servers installed at Anand Agricultural University and Sachivalaya.

The system hardware comprises of Application server, Database server, Email / Antivirus server and the various client machines. All servers reside in the server farm at Sachivalaya and are accessible directly through GSWAN to only authorized users while Internet users cannot access these servers directly. The entire system architecture is depicted in the following figure showing with overall network set-up.

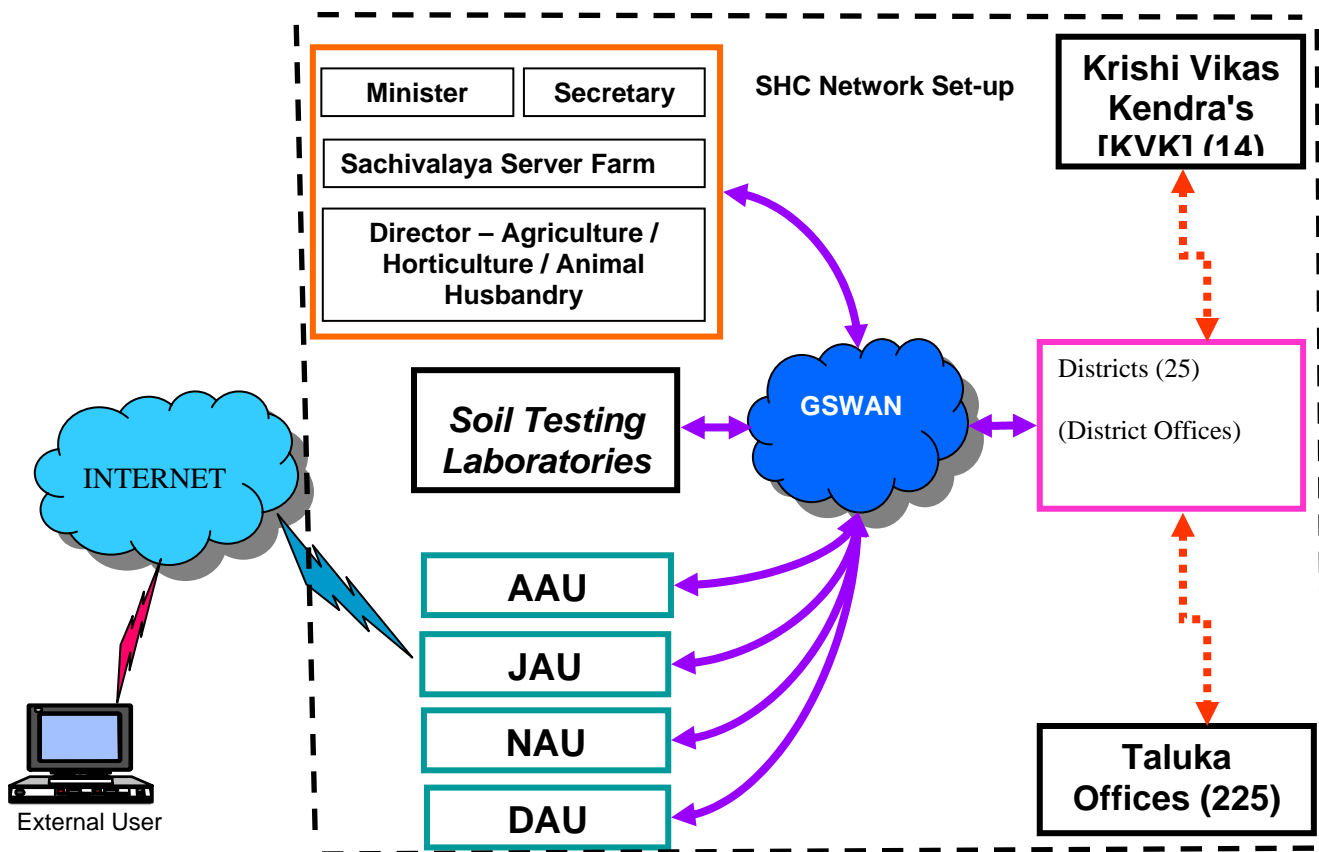


Figure: Overall Network set-up for SHC System



Hardware and Layer Software Summary

The following tables summarise the system hardware and layer software used in the SHC project.

HARDWARE	DAG	AAU	NAU	JAU	SDAU
Database Server	1	1			
Mail/Web Server	1	1	1	1	1
Firewall with Antivirus		1	1	1	1
Backup Server with antivirus S/W	1				
Nodes (Desktop PCs)	80	10	10	10	10
Printers	60	9	6	9	6
Firewall FORTIGATE 200		1	1	1	1
48 port managed switch	1	1	1	1	1
42 U Rack	1	1	1	1	1
2 KVK UPS		2	2	2	2
500 VA UPS	80	10	10	10	10

SOFTWARE	DAG	AAU	NAU	JAU	SDAU
Windows 2003 std Server	2	2	1	1	1
Windows 2003 Server (Enterprise)	1	1	1	1	1
Windows 2003 CAL	80	30	30	30	30
MS-SQL Server 2000 (Enterprise)	1	1			
MS-Exchange Server	1	1	1	1	1
MS-Exchange Server CAL	80	30	30	30	30
MS-Office 2003	90	46	46	46	46
Trend Micro Antivirus (Enterprise)	90	47	47	47	47



Application Structure

The SHC application has a modular structure and the following paragraphs briefly describe the different modules.

Soil Health Card Module

This module facilitates the management of master information about the agro-climatic zones, regions, districts, talukas, villages, farmers, plots etc. Apart from these master datasets, this module also allows the authorised user to enter and update the plot-wise, year-wise information on soil analysis, current crop and other details about individual farmer's plots. The Soil health Card module contains various types of qualitative and quantitative reports and also special reports like individual soil health card and village soil health card.

Crop Management Module

The Crop Management module manages the master crop information including crop groups, crops and crop varieties. It also allows the users to maintain detailed information on crop-wise and agro-climatic zone wise package of practices for various crops.

Recommendation Module

The Recommendation module collects, collates and manages information, which is the base for scientific recommendations provided to the farmers by the Agricultural Scientific Community. It gathers various kinds of inputs like weather data, soil type data, economic and profitability data, agricultural data, performs calculations on various factors that effect crop production and facilitates generation of recommendations for the farmers.

Action Plan Module

The function of this module is to capture all kinds of agricultural, demographic, geographic, climate and socio-economic data associated with a Taluka or a village so that these inputs can further be used to decide about the effectiveness of the recommendations given to the farmer and chalk out the Taluka and Village level action plan of the state Government for improvising the overall agricultural yield.

Administration and Security Module

The SHC system is used by various users like scientists, administrators, planners, extension workers, farmers and general public. The function of the Administration & Security Module is to establish a security environment and manage roles and control access for all type of users depending on their role and the location.