

TECHNICAL SPECIFICATION FOR SOFTWARE TO MANAGE POULTRY FARM DATABASE

Version 2.0 04.10.2018

Diary for Material Changes

A* : Add – M: Modify – D: Delete

Date	Items	Status (A* – M – D)	Note
01.03.2018	Init version	A	
10.03.2018	Update Detail of functions	M	After discuss with DLP
10.04.2018	Update servers' configuration	M, D	After testing with SDAH staff in Tien Giang and Thai Nguyen

Table of Contents

I. Introduction	3
II. System Users and workflow	3
III. Software model.....	5
IV. Software's main functions.....	7
User Management/ security	7
Farm data management.....	7
Creating reports	9
Data Search.....	9
Notification system.....	9
Other requirements	9
V. Server Solution	9

I. Introduction

The pilot poultry farm database system developed and implemented in Thai Nguyen and Tien Giang provinces is a web application, based on relational database. The users from poultry farms and animal husbandry and veterinary staff are able to access to update data of their farms. Farmers can find market information to make decisions on start new flocks or sold out poultry. The authorities from central (DLP) or provincial level are able to access to get poultry population data for poultry management. The system is in both English and Vietnamese.

II. System Users and workflow

There are five groups of system users:

- (i) Poultry farmers
 - Function:
 - Provide poultry farm data for first time registration in the system (one time).
 - Inform Commune Animal Health Workers (CAWs) on number of poultry heads when selling poultry or start new flocks
 - Authority:
 - View information of his/her farm data using smart phones or desktops/laptop (by using his/ her farm ID)
 - Access system to get information on poultry population, increase/ decrease number of poultry (general data of their province and nation)
 - Cannot see data of other farms
- (ii) Commune animal health workers:
 - Function:
 - Use hard copy of questionnaires to collect poultry farm data for first time registration (one time)
 - Inform farmers their farm IDs after receive information from district staff
 - Update farm data on number of poultry heads when farmers selling poultry or start new flocks (after receive information from farmers) by using smart phones or desktops/ laptops
 - Authority:
 - View and edit information of all farms in his/her commune
 - Create report on poultry population and statistics of their commune

- Access system to get information on poultry population, increase/decrease number of poultry (general data of their province and nation)
- (iii) Staff at District Veterinary Station (DVS):
 - Function:
 - To enter farm data for first time registration and issue farm ID
 - Inform farm IDs to CAWs
 - Authority:
 - Have full administrative rights (add/edit) for their DISTRICT data
 - After district staff enter farm data into the system, no one can delete farm ID and associated data (this is due to the installation of the system administrator)
 - Export data of their DISTRICT to excel; view data as charts, maps and save them to image format to use for other purposes
 - Create report on poultry population and statistics of their district
 - Send reports on poultry data of his/ her district by email or notification to higher level
 - Access system to get information on poultry population, increase/decrease number of poultry (general data of their province and nation)
 - Cannot edit the data of other districts
- (iv) Staff at Sub-department of Animal Health (SDAH):
 - Function:
 - Review and validate the data entered by district staff
 - Support district staff on entering data
 - Authority:
 - Have full administrative rights (add/edit) for their PROVINCE data
 - Export data of their PROVINCE to excel, view data as charts, maps and save them to image format
 - Send reports on poultry data of his/ her province by email or notification to higher level
 - Create report on poultry population and statistics of their province
 - Access system to get information on poultry population, increase/decrease number of poultry (general data of their province, nation)
 - Cannot edit the data of other provinces
- (v) Staff at Department of Livestock Production (DLP):
 - Function:

- System management and maintenance
- Review and validate the data in the system
- Authority:
 - Entitled to view/export/summarize/edit farm data of all provinces
 - Send reports on poultry data by email or notification to higher level

All these users from district to province and central levels are entitled to an account to perform their respective functions.

III. Software model

The application is designed and developed on advanced Oracle secure and high performance framework. The application allows users to read, update, manage the farm data and make reports from anywhere and anytime. The application also integrates Global Positioning System (GPS) technology, so that users can manage, find or extract detail data through map visual interfaces. The reports, statistics are formed automatically in many different formats including table and diagramme and decomposed in detailed data according to time, region, administrative area and poultry species. The application is user-friendly interfaces, so that farmers can interact easily with the database.

It can run on a network server using any operating system like Windows, Linux, Solaris, etc. The users are able to access to the application by several different devices like computer, tablet, smartphone with the same interface using any network connection like fiber, wifi, 3G, 4G, etc.

The application has three layers including database, application management and user interface.

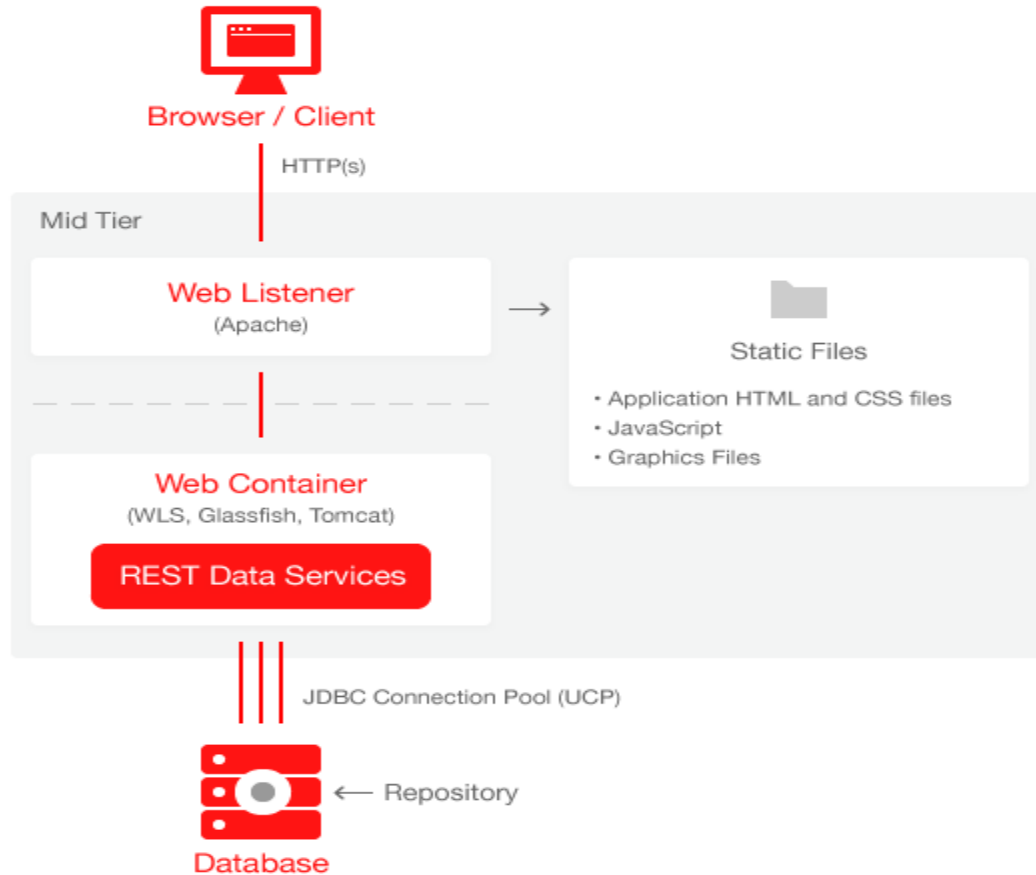


Figure 1: Detail of components of system

Data server (database)

Database server Oracle include three configuration structure components. The system capacity (fast/slow) depend on processing speed of the data server. Database Oracle is selected for the software because of the following reasons:

- Oracle can manage database by using tools like enterprise manager database control, grid control, performance tuning and diagnostic pack, etc.
- Available back up data when the system is operating (stored data entered when the system shut down)
- Ensure high security level for database
- Tools developed are robust (form, report, easy to extend, high security)

- Strong continuous and timely support from Oracle supplier (in Viet Nam and outside Viet Nam)

Middle Layer (Application management)

The middle layer includes Web Server and Web Container allows to receive the client requests through the web browser or the application on mobile device and send the request to the data server, reload the process processing data server to convert to user.

The system also allows the security settings, firewall and the interfaces with other systems through Representational State Transfer (REST) Web Services, this mode is allowed to connect with other software (in other services) or other devices (for example chip tracker in farm).

End user layer (user interface)

The users can access the system through the web browser (Firefox, Chrome, Safari) or through the applications on mobile device.

IV. Software's main functions

User Management/ security

System administrator at central level creates group functions which allow group members to access function system.

System administrator at central level creates group access data which allow group members to access selected farms in each district or province.

The user management function allows to create user accounts. The system administrator at SDAH level have the right to create accounts to access the system and can manage all accounts in their province. The accounts created by SDAH admin will be sent to the district level.

The system administrator at district level have the right to create farm accounts.

Farm data management

Staff from district level use their given accounts to enter farm data into the system. Farm data includes the following fields:

- Basic farm data

STT	Field	Type	Description
1	Farm name	Varchar2	
2	Location/ address	Varchar2	Village, commune, district, province
3	Longitude, latitude	Number	
4	Poultry breeds	LOV	4 levels (species, imported/local breed, name of poultry breed, production purpose)
5	Farm ID	Varchar2	Farm ID structure: AA.BBB.XXXXXX AA: Province code BBB: District code XXXXXX: farm number (auto issue)
6	Farm owner information	Varchar2	Name of farm owner
7	Veterinary (vaccination)		Name of veterinary staff in charge
8	Farm capacity	Varchar2	Areas, number of chicken houses, open/ close pen, capacity
9	Achieve certificates	FILE	Attached files all certificates the farm achieved

- Increase poultry population (nhập đàn)

STT	Field	Type	Description
1	Poultry breeds	LOV	
2	Volume	Number	
3	Transaction date	Date	
4	Lot number	Number	
5	Poultry age	Number	
6	Suppliers	Varchar2	
7	Address supplier	Varchar2	

- Decrease poultry population (xuất đàn) (lot number, volume, time of transaction, transaction number, buyers)

STT	Field	Type	Description
1	Lot number	LOV	
2	Volume	Number	
3	Transaction date	Date	
4	Buyers	Varchar2	

7	Buyers address	Varchar2	
---	----------------	----------	--

Creating reports

The software will automatically create reports in the forms provided by DLP based on the data input. The users can choose to print or save as word, excel files. The reports including following information in different forms (charts, table):

- Total poultry population by different poultry breeds
- Total number of farms;
- Poultry egg and meat productivity;
- Number of poultry breeding;
- Farm locations (maps, farm density).

Data Search

The software enables users to search and view farm information from the database. The level of information specification depends on the user permission level. The information can be displayed as lists, maps or graphs.

Notification system

Allow notified by email. Notifications are sent when increase/ decrease poultry population.

Other requirements

- Use Google Maps or similar open source technology to show map of outbreaks
- Use Oracle JET for displaying chart of farm database.

V. Server Solution

Rented cloud server.

Poultry farm data is concerned by poultry farmers and animal health sector. The regular users access the system for data entry and poultry farm data search. The number of people entry data can be estimate but number of people search farm data is difficult to estimate, it depends on the interesting level of the website. In theory, people can search information on poultry population increase/ decrease to make decision on selling poultry or start new flocks, where is the farms have poultry ready to sell, etc.

Let's assume, Viet Nam has 1,000,000 households raising poultry from average and large scales, if apply in half of the country (the remaining provinces may not keen to apply the system) the system should contain data of 500,000 farms. Let's assume these farms update

data one time every 4 months, meaning 1,500,000 data entry are made each year and around 300 data entry each hour. Experience from Thai Nguyen and Tien Giang provinces, it takes 10-15 minutes for one data entry.

Let's assume the double number of users access the website for searching poultry farm data, meaning 600 visits each hour. Assume that one visit take 5-10 minutes.

With the above calculations, at the same time, producing 300 users access at the same time.

On average, one data entry require 34 KByte for data store. The proposed bandwidth is 100Mbps which allow 300 users to access the system at the same time.

With these assumptions, the following configuration of server proposed.

Category	Requirement
CPU	8vCPU E5-2690 v3 @ 2.60GHz
RAM	32GB
SSD	300GB
Internet speed	100 Mbps
Capacity	300 users current access

Annex1: Reports of farm database system – Output of system (Based on request from DLP)

Báo cáo thống kê số lượng đàn thực tế đang nuôi:

	Số lô	Loại vật nuôi	Tên vật nuôi	Hướng sản phẩm	Số lượng (Con)	Trạng thái	Số lượng còn lại	Ngày nhập	Tổng số đã xuất	Huyện/Quận	Xã/Phường
	180803-3	Gà	Gà chọi	Gà hướng trứng	200.000	Hoàn thành	200.000	03-08-2018	0	Huyện Phố Yên	Xã Minh Đức
	180801-4	Gà	Gà khác	Gà hướng trứng	100.000	Hoàn thành	99.000	01-08-2018	1.000	Huyện Phố Yên	Xã Minh Đức
	180502-1	Chim Cút	Cút Đê	Trứng lặt (Trứng không phối)	90.000	Hoàn thành	89.000	02-05-2018	1.000	Huyện Phố Yên	Xã Minh Đức
	170220-1	Gà	Gà khác	Hướng trứng	40.000	Hoàn thành	40.000	20-02-2017	-	Thành phố Thái Nguyên	Xã Thịnh Đức
	180625-5	Gà	Gà CP	Gà hướng trứng	30.000	Hoàn thành	30.000	25-06-2018	-	Huyện Chợ Gạo	Xã Hòa Định
	171201-1	Gà	Gà ISA Brown	Gà hướng trứng	25.000	Hoàn thành	25.000	01-12-2017	-	Huyện Chợ Gạo	Xã Phú Kiết
	180802-2	Gà	Gà chọi	Gà hướng trứng	20.000	Hoàn thành	20.000	02-08-2018	0	Huyện Phố Yên	Xã Minh Đức
	180425-4	Gà	Gà ISA Brown	Gà hướng trứng	20.000	Hoàn thành	20.000	25-04-2018	-	Huyện Chợ Gạo	Xã Hòa Định

Bảng tổng hợp cơ sở chăn nuôi

Định dạng xuất: RTF

In

Q

Tìm kiếm

1. Primary Report

Chức năng

Vùng sinh thái	Tỉnh	Huyện	CSCN Gà	CSCN Vịt	CSCN Khác	Tổng số con	Năm trước
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	822-Huyện Chợ Gạo	184	9	208	-	-
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	821-Huyện Châu Thành	28	1	29	-	-
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	815-Thành phố Mỹ Tho	13	0	15	-	-
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	823-Huyện Gò Công Tây	13	2	15	-	-
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	824-Huyện Gò Công Đông	26	2	28	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	172-Huyện Phố Yên	50	0	50	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	173-Huyện Phú Bình	97	3	99	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	168-Huyện Phú Lương	57	1	58	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	169-Huyện Đồng Hỷ	0	0	0	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	165-Thành phố Sông Công	29	0	29	-	-
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	164-Thành phố Thái Nguyên	47	2	49	-	-

Báo cáo về số con thương phẩm

In

Tháng/Năm?(Chọn là tháng) ☒

Tháng

07-201

Định dạng xuất

RTF

Q

Tìm kiếm

Chức năng

Vùng sinh thái	Tỉnh	Gà Thịt	Gà Trứng	Vịt thịt	Vịt trứng	GC khác thịt	GC khác trứng	Tổng con thịt	Tổng con trứng
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	8.450	600	-	-	700	-	9.150	600
Đồng Bằng Sông Cửu Long	82-Tỉnh Tiền Giang	43.800	6.000	-	1.100	-	-	43.800	7.100

1 - 2

Trang chủ \ Báo cáo \

Báo cáo về sản lượng thịt

In

Tháng/Năm?(Chọn là tháng)

☒

Tháng

08-201

Định dạng xuất

RTF

Q

Tìm kiếm

Chức năng

Vùng sinh thái	Tỉnh	Gà Thịt	Vịt thịt	GC khác thịt	Tổng con thịt
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	8.056	-	600	8.656

1 - 1

Số lượng gia cầm giống ông bà, bố mẹ

In

Tháng/Năm?(Chọn là tháng) ☒

Tháng

07-201

Định dạng xuất

RTF

Q

Tìm kiếm

Chức năng

Vùng sinh thái	Tỉnh	Gà Ông Bà	Gà Bố mẹ	Vịt Ông bà	Vịt Bố mẹ	Khác Ông bà	Khác Bố mẹ	Tổng số Ông bà	Tổng số Bố mẹ
Trung Du Miền Núi Phía Bắc	19-Tỉnh Thái Nguyên	71.000	-	-	-	-	-	71.000	0

1 - 1