# Contents

# 1.    Information needed for business decisions

## 1.1.    Top ten clients

### 1.1.1. Description
The farm owner wants to view the top ten clients, as well as the total revenue generated from these clients, per farm for a certain time period (three-monthly or yearly). This information will be used to determine discount for these clients in the future.

### 1.1.2. Organizational level
Top level management (farm owner) will make use of this information to determine discount for clients.

### 1.1.3. Business area
This information will be used by the farm owner in the financial department.

### 1.1.4. Timespan
The farm owner requires information about the top ten clients for the past year, as well as a three-monthly report.

### 1.1.5. Dimensionality
- Farm
- Time period
  - Three-monthly
  - Yearly

### 1.1.6. Aggregation and granularity
For this query total revenue will have to be calculated by summing all the income for each farm. The users will be able to drill down on this information in terms of the time period (yearly to three-monthly).

### 1.1.7. Format
This information will be displayed on a column chart where the x-axis will represent the different clients and the y-axis will represent the total revenue generated by the client. The users will be able to drill down on this information in terms of the time period (yearly to three-monthly).

## 1.2. Additional costs in relation to income

### 1.2.1. Description
The owner and farm managers want to view the relation between additional costs and income for a certain time period (monthly or yearly), to determine the financial position of each farm.

### 1.2.2. Organizational level
Top level management (farm owner and farm managers) would be interested to view this information for future decision making.

### 1.2.3. Business area
This information would be part of the financial department.

### 1.2.4. Timespan
The users will view this information per month and per year, for at least the past five years.

### 1.2.5. Dimensionality
- Time
    - Yearly
    - Monthly
- Farm

### 1.2.6. Aggregation and granularity
The total revenue and total expenses need to be calculated by using a summation. The user will be able to drill down from viewing the data yearly to monthly.

### 1.2.7. Format
The information will be viewed as a clustered column chart where the x-axis represents the time period and the y-axis represents the total income or  total expens. The user will be able to drill down from viewing the data yearly to monthly.

## 1.3. Employees' contribution to total hours worked

### 1.3.1. Description
The farm managers want to see the percentage of time each employee has worked in relation to the other employees for a given time period (daily, monthly, yearly). They will use this information to determine if each employee is working efficiently. The formula to be used is:

$$Contribution = \frac{Total\ hours\ worked\ by\ employee}{Total\ hours\ worked\ by\ all\ employees} * 100$$

### 1.3.2. Organizational level
Information regarding employees' working hours is required by mid-level management, i.e. farm managers.

### 1.3.3. Business area
This information will be used for the purpose of human resources.

### 1.3.4. Timespan
The farm managers would want to view reports of the information in terms of the employees' daily, monthly and yearly hours worked.

### 1.3.5. Dimensionality
- Time
  - Yearly
  - Monthly
  - Daily
- Employee

### 1.3.6. Aggregation and granularity
For this information several levels of aggregation are needed. Firstly the total hours worked by each individual employee as well as the total hours worked by all of the employees need to be calculated using a summation. Secondly each employee's contribution should be calculated by dividing their hours worked with the total hours worked for all employees. The user will be able to drill down on the time period.

### 1.3.7. Format
This information will be represented in a pie chart, when viewing all employees' hours worked in relation to the other employees. It will also be represented in column chart when viewing

the information for a single employee, where the x-axis represents the time period and the y-axis represents their contribution.

## 1.4. Breakeven point

### 1.4.1. Description
The farm owner needs to determine how many sheep each farm should breed and sell in order to start making a profit, thus he wants to view the breakeven point for each farm per month. This is calculated with the following formula:

$$Breakevenpoint = \frac{Total\ fixed\ expenses}{Average\ selling\ price - Average\ variable\ expenses}$$

### 1.4.2. Organizational level
This information is needed by top level management (farm owner).

### 1.4.3. Business area
The financial department will use this information to determine how each farm can reach its goal.

### 1.4.4. Timespan
The information will be needed on a monthly basis.

### 1.4.5. Dimensionality
- Farm
- Timespan
  - Monthly

### 1.4.6. Aggregation and granularity
Several levels of aggregation are needed to display this information. Firstly, the average selling price, as well as the average variable expenses has to be calculated. Next the difference between these two values has to be calculated. Lastly the breakeven point has to be calculated by dividing the sum of all the fixed expenses with the previous answer.

### 1.4.7. Format
Information about the breakeven point for each month will be displayed using a column chart, where the x-axis represents the month and the y-axis represents the value of the breakeven point.

## 1.5. Average sales

### 1.5.1. Description
The farm owner wants to view the average sales per farm for a specific time period. It is good to compare the different farms' competence against that of each other, the sales or revenue of the farm determines its competence. This will be used to identify whether a farm needs additional attention in comparison with the other farms.

### 1.5.2. Organizational level
This information concerns the top level management i.e. the managers of each farm as well as the farm owner.

### 1.5.3. Business area
This information can be useful to the production department as well as the financial department.

### 1.5.4. Timespan
This information will be viewed per year for the owner as well as per month for the mid-level managers on a time scope of five years.

### 1.5.5. Dimensionality
- Farm
- Time
  - Yearly
  - Monthly

### 1.5.6. Aggregation and granularity
This query needs to calculate the average of all the sales in the preferred time period for each farm. The sales consist of the amount of wool, meat and sheep sold. This would then give an indication of which farm performs either above the norm or below, either way this information can be used to the farm's advantage.

### 1.5.7. Format
The information will be graphically illustrated with the use of a 3D column chart where the x-axis denotes the farm, the y-axis the time unit (month or year depending on the organizational level) and the z-axis the average sales.

## 1.6.  Average expenses

### 1.6.1. Description
The average expenses per farm for a certain time period are needed by the farm owner and farm managers. This information will be used to compare the average expenses of each farm against each other, which can be used to spot unnecessary expenses.

### 1.6.2. Organizational level
This information concerns the mid-level management i.e. the managers of each farm, as well as the top level management, i.e. the farm owner.

### 1.6.3. Business area
This information can only be useful to the financial department.

### 1.6.4. Timespan
This information will be viewed per year for the owners as well as per month for the top level managers on a time scope of about five years.

### 1.6.5. Dimensionality
- Farm
- Time
    - Year
    - Month

### 1.6.6. Aggregation and granularity
This query will need to calculate the average expenses in the preferred time period of each farm. The expenses consist of all expenses related to improving the sales. This would give an indication on whether a farm spends more capital than which is required.

### 1.6.7. Format
The information will be graphically illustrated with the use of a 3D column chart where the x-axis denotes the farm, the y-axis the time unit (month or year depending on the organizational level) and the z-axis the average expenses.

## 1.7.  Age of employees

### 1.7.1.  Description
It will be interesting to see the productivity relationship to the age of the employees, by using this information one could identify the right time to hire new employees in order to raise productivity levels of a farm. Thus the management of the farm wants to view the average age of employees per farm in relation to each farms productivity (measured by hours worked and revenue generated per farm).

### 1.7.2.  Organizational level
This information is only concerned by the top level managers since they are the ones ultimately making the recruitment decisions.

### 1.7.3.  Business area
This information will be handled by the human resources department.

### 1.7.4.  Timespan
This information will be viewed per annum for a maximum timespan of five years.

### 1.7.5.  Dimensionality
- Farm
- Time
    - Yearly
    - Monthly

### 1.7.6.  Aggregation and granularity
This query will need to calculate the ages of each employee on each farm, followed by calculating the average age of the employees for each farm. It will also be necessary to calculate the productivity of each farm; this will be done by using the revenue data and the amount of hours worked of each farm.

### 1.7.7.  Format
This information will be displayed via a 3D line chart, multiple lines will demonstrate the productivity levels of each farm while the y-axis denotes the time in years, the z-axis the productivity level and the x-axis the average age of the employees.

### 1.8.    Farm profitability

### 1.8.1. Description
The owner wants to evaluate his farms by comparing the profit of each farm to one another for certain time periods (monthly or yearly).

### 1.8.2. Organizational level
Top level management (the farm owner) would be having the privilege in accessing finance information from all farms and comparing them.

### 1.8.3. Business area
This information would be part of the financial department.

### 1.8.4. Timespan
The system user will be able to view the information compiled per month or yearly that dates back up to five years.

### 1.8.5. Dimensionality
- Time
  - Yearly
  - Monthly
- Farm

### 1.8.6. Aggregation and granularity
For this query, the aggregation required would be to calculate the total profit earned per farm. This will require knowing the total income and expenses of each farm for the estimated time. The query will be drilled down per farm (total profit) and per month or year.

### 1.8.7. Format
The information will be presented as a line graph where the profit will be displayed on the Y-axis and time on the X-axis (yearly or monthly).

### 1.9.    Temporary employees

### 1.9.1. Description
The managers want to collect information regarding the temporary workers for a period (one year) to improve on human resource management decisions. Thus they want to view the total hours worked per employee per year.

### 1.9.2. Organizational level

Mid-level management (farm managers) must be able to access the information during their human resource management duties.

### 1.9.3. Business area

This information would be part of the human resource department.

### 1.9.4. Timespan

This information is needed with regards to temporary employees who worked during the current year. It will also be useful for this information to keep track of multiple years of employees' work hours.

### 1.9.5. Dimensionality

- Time
    - Yearly
- Employees

### 1.9.6. Aggregation and granularity

For this query, the aggregation required would be calculating the total number of temporary employee who worked during the year and their hours worked during that year. This will require knowing who was temporarily employed and their hours worked. This query will be drilled down on the hours worked (total) by temporarily employee and per year.

### 1.9.7. Format

The information will be presented in column chart where the X-axis are the numerous employees who worked and the Y-axis are their hours worked.

### 1.10. Influence of weather on product quality

### 1.10.1. Description

To measure the influence of weather circumstances over a time period (three months or seasonal) on the quality of a variety of products to determine irregularities. Data about weather conditions are stored in a spreadsheet. Thus the information that will be needed is the overall quality of products per farm in relation to the weather conditions of a time period.

### 1.10.2. Organizational level

The owner should factor in irregularities caused by the weather in comparing farms and managers will use such information in diagnosing problems with quality and low birth rate.

### 1.10.3. Business area

This information would be part of the planning department.

### 1.10.4. Timespan

The information will be compiled every three months and will date back, up to five years.

### 1.10.5. Dimensionality

- Product
- Farm
- Time
  - Three-monthly
  - Seasonal

### 1.10.6. Aggregation and granularity

For this query, the aggregation required would be calculating the average amount of weather and quality changes. This would require knowing all the changes in weather conditions (rain, temperature, humidity and wind) and changes in quality (lamb weight and wool grading) for a specific time-period. This query would be drilled down per change in weather (on average) and per season or thee-monthly.

### 1.10.7. Format

The information will be presented as a line graph where the weather conditions (rain, temperature, humidity and wind) will be displayed on the Y-axis including the product quality state and time on the X-axis (three-monthly or seasonal).

### 1.11. Lamb breeding per farm

### 1.11.1.　　Description
The owner wants to be able to see the amount of lambs born unto every farm individually. He also wants to see this information for specific periods of time – yearly or monthly. This will allow him to extract valuable information regarding the ewes that lambed. He may also pick up certain patterns that may be of worth. Thus the information needed by the users is: the average number of lamb births per farm for a time period.

### 1.11.2.　　Organizational level
This information would only be accessible for people in top-level management positions. The reason therefore is that the data would be used for information/decision-related purposes. It would help top-level management to compare the birth-rate per each farm individually and derive business-insights therefrom.

### 1.11.3.　　Business area
This information would be part of the production-and-operations department of the company.

### 1.11.4.　　Timespan
The system user will be able to view the amount of lamb born for any given month or year. Further detail, such as daily births will not be able to convey significant patterns or trends.

### 1.11.5.　　Dimensionality
- Time
  - Yearly
  - Monthly
- Farm

### 1.11.6.　　Aggregation and granularity
For this query you would need to calculate averages of total lambs born for specific periods of time. You would need to be able to show this information in regards to specific farms and specific periods of time.

### 1.11.7.　　Format
The information of this query will be presented with a 'time' and 'farm' dimension. Presented visually, a clustered column chart will be efficient. The user will be able to select the lambs born in total or per farm on the y-axis. On the x-axis the user can request time-variant data at differing levels of aggregation: yearly and monthly.

### 1.12. Lambs per ewe

### 1.12.1. Description
The owner wants to be able to view the average amount of lamb born per ewe for a period of 12 months. This doesn't focus on individual farms per se, but zooms in on the individual ewe.

### 1.12.2. Organizational level
Mid-level management must be able to access this information. This information would mainly be used for comparative purposes, allowing managers to reflect on a given year versus another. It would help in the case of making decisions that could affect the amount of lamb being born and viewing the impact it could have.

### 1.12.3. Business area
This information would be part of the production-and-operations department within the company.

### 1.12.4. Timespan
Information regarding average lambs born per ewe would be calculated and viewed per annum and should include information about the past five years.

### 1.12.5. Dimensionality
- Time
  - Yearly
- Product (ewe and lamb)

### 1.12.6. Aggregation and granularity
For this query, the aggregation required would be calculating average amounts of lamb born per ewe. This would require knowing the total amount of ewes and total amount of lambs born for a specific time-period. The query would be drilled down per ewe (on average) and per year.

### 1.12.7. Format
The information for this query will be presented visually on a clustered column chart. The dimensions that are to be covered will be the dimension of time (on the x-axis, selectable for periods of 12 months) and of product, i.e. the calculated average of lambs birthed per ewe (on the y-axis)

### 1.13.  The best-selling products

### 1.13.1.　Description
Users would want to be able to see the products with highest demand. They want to be able to see this per individual farm for any given month or year.

### 1.13.2.　Organizational level
Knowing the best-selling product and deriving statistical information therefrom is to be known for managerial levels and higher. Enormous business insights can be derived from this; you can see strengths to capitalize on as well as weaknesses to address.

### 1.13.3.　Business area
This information would be part of the sales-and-marketing department within the company.

### 1.13.4.　Timespan
This query will provide information in a monthly as well as yearly (annual) structure.

### 1.13.5.　Dimensionality
- Farm
- Time
    - Yearly
    - Monthly

### 1.13.6.　Aggregation and granularity
For this query the aggregation required will be calculating total amounts by summing certain numbers together [For sheep this would entail the total number of sheep sold and the revenue collected]. The level of aggregation applied to this query must start at farm-level (showing best-selling product per farm) and roll down to different periods of time per farm (showing best-selling products per farm for certain periods of time).

### 1.13.7.　Format
This information for this query will be shown visually on a clustered column chart with multiple values per category. Its y-axis will denote the value of each farm's top-selling product for the given time-period individually. Its x-axis will denote the chosen dimension of time (monthly, yearly).

## 1.14. Effect of the weather on the condition of the sheep

### 1.14.1.　　　Description
To be able to plan ahead properly, it is necessary know the effect the weather conditions will have on the health of the sheep, the quality of their wool etc. Thus information is needed about the condition of each sheep during the past three months as well as the weather conditions on each farm.

### 1.14.2.　　　Organizational level
The manager of each farm would be interested in the weather effect on the sheep since they are in charge of decision making at their respective farms.

### 1.14.3.　　　Business area
This information will be classified under the livestock department.

### 1.14.4.　　　Timespan
To be able to accurately determine the effect of the eater on the sheep, a timespan of five years will be used. The data will be displayed per year or per season.

### 1.14.5.　　　Dimensionality
- Time
  - Yearly
  - Seasonally
- Farm

### 1.14.6.　　　Aggregation and granularity
Answering this query would require the average weight of the sheep and the weather conditions over a specific time period. This data will be gained from external sources. The aggregation level of the information can be drilled down to per season, per farm and per sheep.

### 1.14.7.　　　Format
The information will be displayed in multiple stacked line graphs, one for each season or year, showing the correlation between a weather condition (temperature, rainfall etc.) on the y-axis and the weight of the sheep on the x-axis since this is the best way to determine the health of the sheep. Each graph will have one line for each farm.

## 1.15. Influence of the weather conditions on the productivity of the workers

### 1.15.1.          Description
To ensure each farm delivers the maximum of produce, it is important to know how well and effective the workers complete their work under certain circumstances. Thus information is required about the productivity of workers (based on the hours worked), the type of workers on each farm as well as the weather conditions on each farm.

### 1.15.2.          Organizational level
Since the manager of each farm is in charge of hiring workers for their respective farms and of the produce from the farm, they will need to have this information to ensure proper planning.

### 1.15.3.          Business area
This information will form part of the information from the recourses department of the farm

### 1.15.4.          Timespan
To obtain an accurate result, a timespan of five years will be used for which yearly and seasonally views will be available.

### 1.15.5.          Dimensionality
- Time
  - Yearly
  - Seasonally
- Farm
- Type of worker
  - Permanent
  - Temporary

### 1.15.6.          Aggregation and granularity
To acquire this information, we will need the sum of the total hours worked on the farm. The weather conditions will be obtained as external data. The information can be narrowed down to per season as well as per worker.

### 1.15.7.          Format
The information will be displayed in a stacked line graph with three lines to represent the three farms. The y-axis will represent a weather condition, for example temperature, and the x-axis will show the amount of produce from the farm.