A CIM CONCEPT FOR THE SLAUGHTER INDUSTRY

CLAUS HAGDRUP

Danish Meat Research Institute, Maglegårdsvej 2, DK-4000 Roskilde

INTRODUCTION

CIM (Computer Integrated Manufacturing) has traditionally been closely connected with order and batch production manufacturers. Very few have dealt with CIM ideas in plants which logistically can be compared with the processes in connection with slaughter, cutting and boning.

In the light of this the Danish Meat Research Institute has started a project with the aim to design a CIM concept for the slaughter processes. The objective of the project is to act as an inspiration for the individual plants to start up their own CIM projects.

METHOD

The starting point in preparing a CIM concept for the Danish pig slaughterhouses has been a top-down analysis, which is based on the corporate strategy and the production strategy of the abattoirs. A CIM strategy is then built so that the strategic levels are:

- The corporate strategy of the abattoir
- Production strategy
- CIM strategy.

This means that the CIM strategy is based on the production strategy which again is based on the corporate strategy.
The CIM strategy includes the essential requirements for the information systems and a policy for purchase and integration of new technology.

The method of creating a CIM concept is then to explain the information flow of the abattoir through a process of gradual refinement. This description includes existing computer systems as well as existing working operations and routines and the non computer based information systems. The expected future possibilities should also be included in the description in a suitable way.

The essential elements are then identified as a result of a gradual refinement in the description and they can finally be coordinated into an overall specification for the system. Another essential output from the process is a project catalogue, which points out a number of activities that may be profitable to initiate, and a plan for initiating the projects.

RESULTS

The basis for the CIM-project has been to choose a slaughterhouse operation as the starting point.

The objective is described as follows:

- To achieve the maximum profit per pig in the convertion of live pigs to a range of intermediate products.

The main strategy for achieving this is:

- To be able to offer supplies which as closely as possible fulfil the changing quality specifications of the individual customer.

In a popular way this can be explained by saying that quality is a more important competitive parameter than cost reduction through volume production.

The aims for the CIM-project derived from the above have been:

- To be able to utilize the received raw materials (live pigs) in the optimal way by using the integrated information systems.

- To ensure customer delivery at the right time, in the right place and of the right quality.

- To pass back information to the producers which enables them to adapt to market developments.

- To contribute to a certain degree of cost reduction in the slaughterhouse industry.

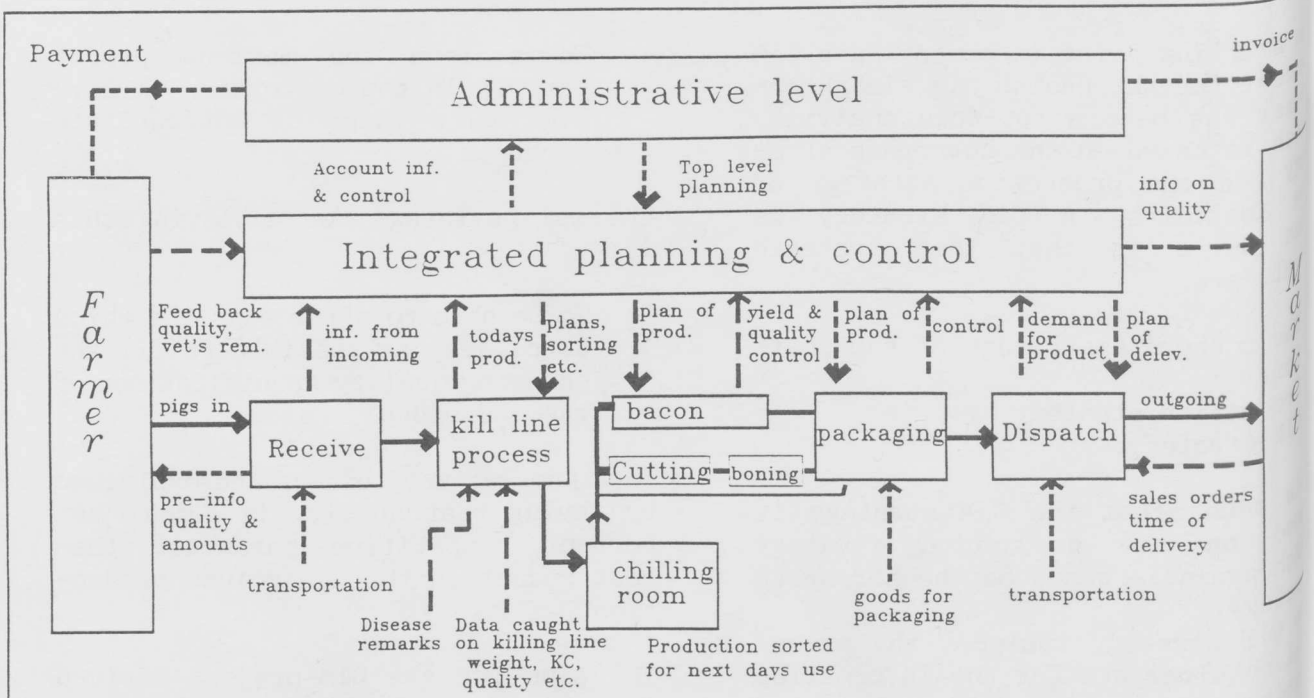
With these superior strategies the focus of the project has been placed on total quality control and on an optimum utilization of the raw materials through integrated planning and control. The figure below illustrates the integrated planning system and the essential information flow between different parts of the slaughterhouse.

The figure illustrates the integrate planning system partly in relation the internal processes in the slaugh terhouse and partly in relation external partners like producers a customers. The planning task can b divided into three major aspects:

1) Planning of future production

According to agreement the Danis system is based on the situatio that the abattoir generally ha to slaughter and sell the slaugh terpigs supplied by its member producers in the best possibl way. It is therefore importan to have as complete information a possible about the slaughterpig which will be supplied in th future.

The number of slaughterpigs i essential information, but als information which is traditionall correlated to quality is of impor tance. Information such as sex breed and parent animals are exam ples of information that may con tribute to an improved informa-



Integrated planning and control.

tion about the quality of future supplies, and can consequently serve as a valuable basis for the planning of tomorrow's production.

2) Planning/arrangement of the current production.

By collecting a large number of data from the slaughter process the possibilities to optimize the use of the raw materials in relation to existing and future sales possibilities become available. In the first place a complete description of the carcasses in the equalizing cold room is made, and these data then form the basis for the detailed planning of the cutting and boning processes. Currently a large number of more or less automated sub systems are used in the production process. The CIM concept can be seen as the total and integrating element in this process.

3) Sales and marketing

The combination of information from the current and future production with booked orders and prognoses for future sales gives a possibility of using the raw materials for the optimum production. Furthermore the collection of quality parameters for the raw materials, makes it possible to deliver goods to the customer which fulfil his wishes within narrow tolerances. Important customers may benefit by drawing on quality- and quantity data for future deliveries. The abattoir may thus achieve competitive benefits.

SYSTEM ARCHITECHTURE

It has been decided that the superior strategy for the information systems in the CIM-project is:

- To create an open and flexible concept for the implementation of new technology and system solutions. This concept should ensure continuity and a reasonable long term benefit of the investments made.

Thus the concept shall be able to survive casual generations of hardware and software and the essential factors to consider are:

- The degree of flexibility and modularity.
- The possibilities of staged introduction/changes.
- Standardization and dependency of supplier.
- Level of integration, use of databases.
- Further development and maintenance.
- Demands for personnel and needs for the daily operation.

Another main factor in the arrangement of the system is the degree of decentralization. We have used four basic levels:

Company level: responsible for the superior planning and control as well as accounts, financial control etc.

Plant/department level: primarily responsible for the daily operation and planning tasks with a view to obtain optimum utilization of the raw materials and effective quality control.

Cell level: the essential task at this level is to function as a connection between information collected at the production and the planning level. The level should serve as a coordinating facility for a quantity of technical equipment and should be able to supply standardized information to the superior planning and control level.

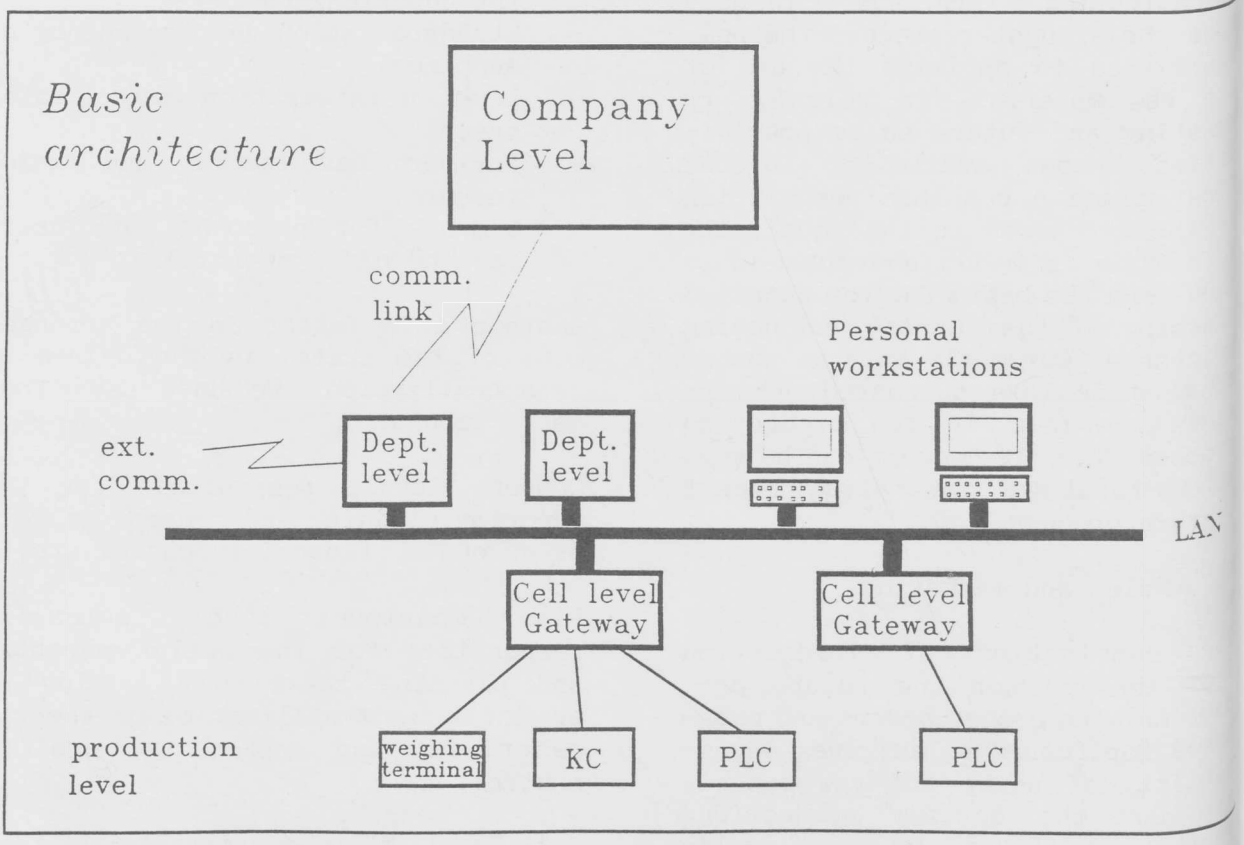
Thus the level is forming a bridge between the very different types of equipment on the production floor, and the wish for a high degree of flexibility and standardization in the superior information system.

Production level: automatic sub systems in the production.
The quantity and the nature of the equipment on the production floor is

very varied. The main types are automation such as PLC-control, the use of advanced measuring equipment, weighing terminals, classification data etc.

The levels and the basic architecture are illustrated below.

Another effect of the CIM-strategy is that future purchases of equipment for information or automation must be subject to this strategy. The CIM strategy thus creates a firm model by which a given purchase can be measured, so that it can be estimated whether the purchase



CONCLUSION

Through a top-down analysis based on the corporate strategy for the company and stagewise refinement and description of the flow of information, a CIM concept can be built up. By further combination with organizational aspects and a general framework and strategies for the implementation of new technology, a concept arises which in many ways is total, involves the whole company. In this way CIM becomes part of a long-term strategy for the company. However, it may be a problem that the start and implementation of CIM-technologies not often result in immediate measurable financial results; they must often rather be seen as a long-term improvement of the competitive power of the company.

will bring the company closer to the final objective.

The road to a realization of the complete CIM-concept must often be taken in stages. The consideration of existing systems and the development of new technology will mean that the shortest way to the goal only rarely is chosen.

REFERENCES

CIM: Computer Steered Industry/ A.-W. Scheer - Berlin: Springer, 1988

CIM/IBM: An Executive Guide, 19[illegible] (IBM From no. G511-0996-1)