PCs in Business Environment

by

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EXECUTIVE SUMMARY

"PCs in Business Environment" is a project that contains two parts. First part is a real life application developed for Nordic Meat Inc. a small food - manufacturer in the KC area, developed in MS Excel 5.0 spreadsheet supported by the Visual Basic Application Language. The application represents a production module as a supplement to the UNIX information system the company has been using for several years.

This part of the report consist of four chapters. Through these chapters I presented problems Nordic has had with product cost structure and product formulations, scheme of interaction between the UNIX system and the PC based system and the solution which I developed in the last couple of months.

In the second part I attempted to answer how to solve "intangible" problems during the phases of system development and system adoption. In the environment of small business which I encountered it was really hard to have people accept the computer. They were afraid of it, they wanted to prove it is producing wrong reports; in other words they wanted to do business as they used to do. It takes time for everyone to adopt change. Through presentations, informal conversation and meetings with employees and management I managed to succeed. The system which I developed emulates information flow in the plant when the PC was not present and reports contain similar information as previously, so everyone is able to find information needed.

In the sixth chapter I answered the question which has been directed to me frequently: "What computer and what system suit my business needs?" Though there is no unique answer to the question, I do believe that a company should have a computer person inside who is familiar with its needs and business. This approach initially looks costly but it reduces a risk of a system abandonment and a project failure.

Lastly, I commented on future trends in the PC industry. I believe that the future belongs to computer networks in every organization. My concern is only the fact that the pace of computer hardware and software industry is too fast for business people to catch up with and take full advantage of all the new software opportunities offered.

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1. How Production in Nordic works

For a company which covers a small niche in the food manufacturing business, key words are flexibility and capability to respond in a timely manner to various orders coming from its customers. Production operations are automated in some degree, but basically are centered on direct labor performance and human skills. Normally, a plant manager or production mangers are developing weekly production schedules, though the company is adapted to readjust its production plan daily when needed. Production adjustments happen almost every week. Reasons are many; urgent incoming orders which cannot wait; food ingredient shortages in inventory on hand due to orders mentioned; understaffing on production lines; etc.

In food manufacturing business, each meat product must meet specification in a portion weight and a percentage of fat. The percentage of fat can be accomplished by more then one product formulation. The decision on what formulation option to use is made based on ingredients available in the inventory, cost of meat and total weekly production demand.

Production managers who are in charge of determining daily production are used to spending significant time to calculate a new option for a product in order to *fulfill an order, use available meat on hand in inventory and meet percentage of fat requirement*. Threats which are present by doing the whole process manually are numerous. The calculations performed are some times inaccurate and they could result in either failure to meet the fat percentage specifications or to miscalculate total demands needed which would lead to incomplete shipments. Both scenarios could hurt the company, causing customer dissatisfaction and frustration.

Working conditions at the plant are very hard for direct labor. Temperatures in production rooms and freezers are low and the job employees perform is mostly manual. Workers on lines are leaving the company as soon as they are able to get an easier job somewhere else, sometimes not

even giving a notice of leave. Supervisors need to be ready to move people quickly from one line to another during the day in order to fulfill a plan. New employees are trained on the spot. It happens that they have to "jump" on the line and become a part of direct labor.

I would like here to expand a little bit more about a position of niche players in general. Problems listed above could be easily resolved by increasing inventory levels e.g. higher levels of resources committed to them. *First,* small businesses have managed to survive, stay profitable or break even by using completely different strategies compared to big industry counterparts. They cannot afford big inventory buffers and people who would be assigned to manage only them. *Second,* due to in this case the meat market fluctuation, the meat purchases are done when the price tends to hit its lows which also adds constraints to the way of running business. *Third,* in most cases educational and skill levels of employees are not adequate to adopt new technologies - for instance computers and computer skills which would make life much easier. Employees hired by small businesses have variety of skills and are able to fulfill more than on particular assignment for an employer. At Nordic Meat Inc. all supervisors and production managers started in the direct labor force and managed to work their way up. *Forth,* small businesses until they establish their reputation in the market place are really involved in the survival game. Customers are hesitant to rely completely on them, which is understandable. They don't know for how long the smalls would be around and could they trust them. I would say that the small business needs at least five years of existence in order to gain sufficient level of trust from customers and suppliers and really plan its budget in a manner big companies do. *Fifth,* once they start growing management postpones information system purchases as long as possible knowing that *it brings mixed emotions* and requires *significant financial resources*. By saying that I mean that on one side the management feels it *needs more control* and *better reporting* to make important business decisions, and on the other side *employees see it as a threat*. In addition to this, big dilemmas come regarding what system is the right one for the business, what ratio price - performance would be optimal , how

much the business and operations would have to change when the system is in place, and what would be the point in time when system would become obsolete.

My intention is to make an attempt to answer those questions talking from experience which I have gained by developing software and helping companies to improve information systems which they already have had in place and by advising them which one to buy. This report I envision as a good source for managers working for companies which are at the point when they need to make a decision about the new system or an upgrade, as well as for all software developers and engineers who need to sell their solutions to the customer. Selling the system would have a separated part in the report with highlights on intangible factors which could help them succeed to eliminate barriers in the organization in the phase of system adoption.

1.1 Production Schedule (Who, When, Why, What and How)

When trying to develop a new option a manager has a list of products to produce and a list of food items available in inventory on hand for a following day. An ideal case would be if he / she would have on hand all ingredients needed to use the original formulation in production. In reality it doesn't happen frequently. When such a situation occurred he / she would consider substitutes for some meat ingredients. *There are some general rules such as:*

1. *He / she can substitute if needed one meat with another with the same or similar percentage of fat. For example Beef Shank which has 10% fat can be replaced with Cow Meat with 20% fat by using the amount which is two times smaller or he / she can replace Beef Trimming with Cube Steak Trimming which have similar percentage of fat.*

2. *He / she has to use the whole ingredient case (for Beef Shank 60 lb.). Once an ingredient is taken from a freezer the whole case must be used up. Apparently, a*

manager has to make sure that meat would not get spoiled. Formulation must include the whole case of meat ingredient. Otherwise it would be tossed away which would increase a cost of product. Another advantage of using the whole case is that it's an easy way to perform inventory count at the end of a week.

3. *When replacing meat he / she has to make sure that the product stays within +/- 1% compared to the original option. If total quantity of meat portion of the batch is not the same as for the original formulation he / she should adjust non-meat portion of the batch to have the same the non-meat / meat ratio. The same applies for breading if existed in the formulation.*

• Most of time managers would substitute one meat ingredient with another and leave non-meat portion as well as breading as it was. By doing it, they would change the fat percentage which would slip out of the 1% band and produce a product which wouldn't be able to meet its specification.

• If production is running and a manager would learn he / she doesn't have enough meat to put into the batch he / she would just add meat available not checking how it would affect formulation. In addition to the fat percentage specification problem, another one occurs, a yield which wouldn't be close to an expected yield.

4. *The batch size cannot not exceed 1,000 lb.*

Assuming that a manger knows all formulation options which could be scheduled for a following day, he / she has to determine <u>number of batches needed for each formulation.</u> To calculate this he / she needs to know:

1. *Number of cases to produce per code; It depends on customer orders and shipping dates.*

2. *Case weight (For most of products it is 10 lb.)*

3. *Average yield for a formulation group.*

• Yield for formulation represents ratio between number of pounds produced and number of pounds used for formulation. Until the supplemental system was developed it was hard to determine what a average yield should be due to many different ways the product could be produced.

4. *Current food - inventory levels.* A manager should define formulations in a way that total daily ingredient demand can be covered from inventory on hand

1.2. Production

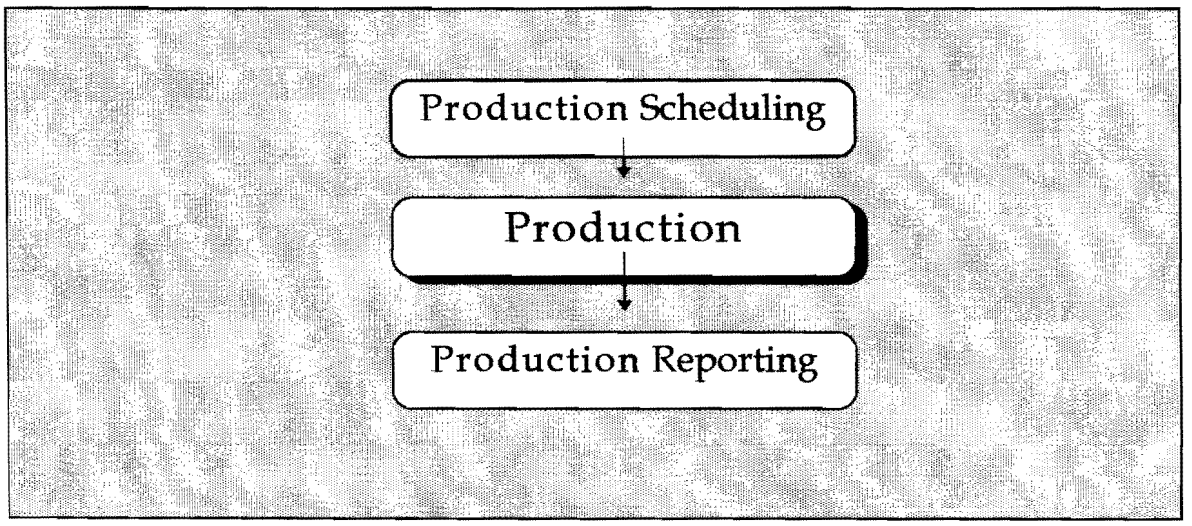


Figure 1.21 Simplified chart of information flow. Once formulations have been defined, reports are sent to production rooms where production is performed.

1.21 Production Rooms

Nordic has four production rooms:

1. ***Liver room***
2. ***Cube steak room***
3. ***Stew room***
4. ***Beef room***

Once *a daily schedule report* has been completed production managers determine:

1. *Production order for group of codes (formulations) in production rooms for a day.*
2. *Direct labor; who would be involved in production for particular day.*
3. *On the daily schedule sheets they are named: employees and estimates of number of hours they would spend on the line.*

Staffing decision is made based on experience, production patterns and people available. As I already mentioned due to low temperatures in production rooms managers frequently encounter understaffing problems.

Until new supplemental system has been developed the direct labor cost was determined based on number of employees in the room and a number of hours they spent there, though it was obvious that different formulations involves different labor effort.

1.22 Production Lines and Product Classes

Each of production rooms mentioned above has more then one production line in it. On each production line one product class can be produced. In other words each product line and a product class differ from others in the length of time needed to produce a case of a product and have different direct labor cost involved.

• Before the supplemental system was developed a direct labor reporting was fairly simplified. All products processed at the same room were considered to have the same direct labor cost per pound produced. This assumption was away from reality but nobody had tried to change it. While I was gathering information and classifying data, I managed to distinguish twenty one different classes of products based on the direct labor involvement. Reporting of direct labor is based on new classification. (See Daily Production Labor Report, Chapter #4.)

1.23 Labor Analysis and Labor Cost Analysis

Production Labor is divided into:

1. ***Direct Labor***

2. ***Support Labor***

3. ***Clean - up***

As I mentioned above *direct labor* differs from one product class to another.

Support labor <u>includes people who move ingredients from inventory to production rooms, who pack finished products and move them to finished goods inventory and who perform any other labor in production other then direct labor and clean - up</u>. *Support labor cost per pound produced* is the same for all products produced in one production day. <u>Total cost of support labor for a day</u>

divided by total number of pounds produced for a day gives support labor cost per pound produced.

The same analogy applies for the *clean - up. Clean - up labor* includes people who clean production lines, machines on them and production rooms, once production has been concluded for a day . Clean - up labor cost per pound produced is the same for all products produced in one production day. Total cost of clean - up labor for a day divided by total number of pounds produced for a day gives clean - up labor cost per pound produced.

Lately, *total labor cost per product per pound produced* is the sum of direct labor cost per pound produced, support labor cost per pound produced and clean - up cost per pound produced.

1.3 Production Reporting (Who, When, Why, What and How)

My intention at this point is to describe production reports as they used to be as well as the way they were generated and calculated. On the following pages a reader will be able to see three old reports; the Raw Material Report, Daily Production Yield and Daily Inventory Report.

1.31 Daily Reporting

When production has been completed for a day a production manager fills out information about ingredients used and amounts used which might differ from what was scheduled. Before the supplemental system was developed the same form was used for scheduling formulations and filling out any changes made in formulations during production. As I mentioned, if it happened that

some amount of meat is not sufficient to fill a batch the manager would on the spot add some other ingredient and write it down on the Raw Material Report (columns "Total Weight" and "Weight per Batch").

At the end of a day, the Raw Material Report would be given to a clerk who would obtain cost from the UNIX system per pound of ingredient and fill in the column "Cost Per Pound" and calculate total cost manually.

All products which were produced for a day go to the inventory of finished goods. Before placing them in the inventory an employee would count product cases and fill in *the Daily Inventory Report.* Once products were in the inventory this report would be given to a clerk. The clerk would for each formulation used add up total amount of pounds produced and based on it, calculate daily yield for formulation. *Daily yield* would be written it the Raw Material Report.

Finally, *at the Daily Production Yield Report, a clerk would enter formulation names, cases produced and ingredient cost per pound.* The ingredient cost per pound produced would be batch cost of ingredients divided by number of pounds produced.

As it can be seen on the Daily Production Yield Report there is an empty space for trim. Trim represents products which do not meet portion weight requirement (4 oz or 5 oz etc.). Such products are sold but on lower price or re-used in other formulations. Before the supplemental system was developed, no ingredient cost value had been assigned to the trim though this product had been used one way or another.

1.32 Weekly and Periodical Reporting

The only production reporting for a week and a period of four weeks which was done was an average yield for a plant, total of pounds produced and total pounds of trim and shrink.

1.33 Explanations of Production Terms

Yield - ratio between number of pounds produced and number of pounds used for formulation

Trim - meat byproducts which can not be sold at the price but which could be reused or sold for less.

Shrink - Everything other then trim and products.

Product Class - Group of products which are manufactured on the same line and which have the same labor cost. There are twenty one product classes in Nordic's production.

Product Formulation - Formulation for a group of products which may differ in portion size. These products have the same ingredient cost and labor cost.

Product line is a manufacturing process for a product class.

Product Code - A code number which a product carries in the UNIX system. A group of codes belongs to the same formulation.

See appendix A: "Old Reports Nordic

2. What the UNIX System cannot do

Nordic Meat Inc. has had a UNIX based information system Facts since 1987. The system was upgraded once in 1993. Though the Facts has a production module it was never suitable for operational needs. It hasn't had capability to enter a new product, attach it to a formulation which already exists and have formulation options saved. In other words it was a system capable to handle orders, shipments, payroll, accounts payable and receivable, etc. but not production activities. The reports which I mentioned were used to prepare data to enter the UNIX system.

1. Data from *the Raw Material Report* were added up to get cumulative of all ingredients used for a day. These numbers were entered to the system which would automatically reduce levels at the inventory. The user would call up the ingredient on the screen, enter the amount and press "sent".

2. Data from *the Raw Material Report* and *the Daily Inventory Report* together were entered to add up inventory levels *at the inventory of finished goods database and calculate total meat cost for a day*. Actually, the user would punch in the code number and the number of cases produced and assign the meat cost per pound of product produced. Labor cost and packaging cost were never entered into the system assigned to the product code.

2.1 Labor analysis and Cost structure

At the UNIX system cost of product code is a meat (formulation) cost per pound produced or per case produced. In addition the net margin of the business never included a labor cost or a

packaging cost. The decision about it was made at the point when the company realized it cannot handle its production through the computer system. Eventually it lead Nordic Meat Inc. to only roughly classify the whole production in four groups by production rooms and spread overall cost of packaging over total number of cases produced. I would say that management decided to simplify calculations and not have employees use a lot of time on them.

As a result management has never learned the real or close-enough-to-be-real cost of production per code. In other words it wasn't be able to determine whether the company was selling a product with profit or loss. Management just knew that they were making money overall and that was the only clue that the company has been heading it the right direction. A new product and its price would be determined as a good guess based on experience and intuition.

In the phase of development of the supplemental system I determined that the price of packaging varies +/- $.020 per pound produced of a product, and that there is a significant difference in direct labor cost per product class compared to an average value. In order to clarify these differences I will explain calculations used as they used to be and with a new system.

Total Labor Cost = Direct Labor Cost + Support Labor + Clean-up

It used to be:

Direct Labor Cost =	**Averaged per one of four production rooms**
Support Labor =	**Averaged for a whole daily production**
Clean-up =	**Averaged for a whole daily production**

With the new system:

Direct Labor Cost =	**Averaged per one of twenty one production classes**
Support Labor =	**Averaged for a whole daily production**
Clean-up =	**Averaged for a whole daily production**

Total Cost = Labor Cost + Packaging Cost + Formulation Cost

It used to be:

Labor Cost =	**Averaged per one of four production rooms**
Packaging Cost =	**Averaged for a whole daily production**
Formulation Cost =	**Based on average cost of ingredients from the UNIX system**

With the new system:

Labor Cost =	**Averaged per one of twenty one product classes**
Packaging Cost =	**Individual for every product code**
Formulation Cost =	**Based on average cost of ingredients from the supplemental system**

2.2 Monitoring Daily Production Yield

Complete monitoring was done for the whole plant based on number of pounds produced and total of all ingredients used. This report was calculated manually after every four weeks. It was not possible to narrow down yields per product room or formulation because formulation

options were many and they lead to different yields. Consistency of the percentage of fat was completely out of control.

First, the supplemental system gives formulation options which have the percentage of fat with the band of +/- 1% of the original formulation, which improves the quality of the product.

Second, the new system narrows down the number which is an average yield per formulation and a product class. To management it means more control in production processes and reports which would raise questions if yields for particular formulation are lower or higher then average. If yield is too high, it might mean that more ingredients were used than necessary. If yield is to low it might mean that less ingredients were used (which changes a product) or that supervisors let employees to toss to much of meat (Besides of the fat percentage, the portion size requirement must be met.)

I mentioned just a few potential production problems, and considering that the system is approximately only three weeks in use its reports are a huge learning experience for everyone at the plant. Every new report shows something new and asks new questions. I am still adjusting them in order to provide to management information needed.

2.3 Actual Cost of Material (Ingredients)

The UNIX system averages cost of ingredient starting from the first day when the ingredient was purchased. Each time when the ingredient is supplied the system adds up the amount and the cost and averages it. Since it has been done for a period of couple of years these data are neither really accurate nor adjusted for inflation. Nordic tried to define a couple of lots for

the same ingredient in the computer in order to get more accurate cost, but it resulted in confusion and difficulties to determine from which lot the ingredient was taken.

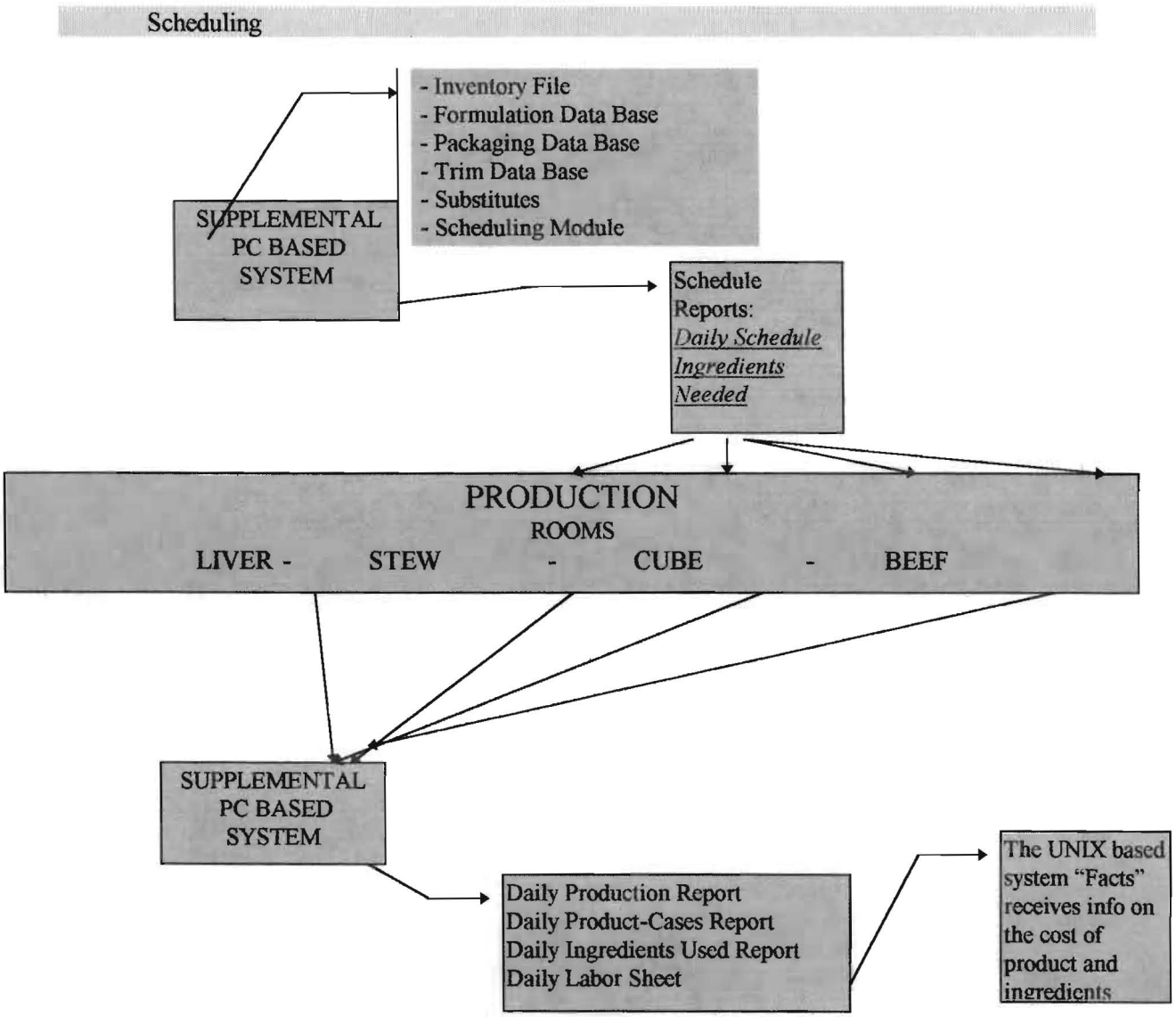
Contrary, the supplemental system averages up the cost of ingredient with a newly received quantity, but if the whole amount was used in production and the lot is empty it starts all over again with the price of the next purchase.

2.4 Tracking of Product Formulations

The UNIX system has not done tracking of formulations, ever. Once production was concluded total usage of ingredients would be entered to the system and manually calculated cost of ingredients would be assigned to the product code. The system would average the ingredient cost for a product based on the same assumption as for an ingredient mentioned above. Compared to it, the PC - based system has in memory formulation which can be used and allows creating new ones.

3. How does the UNIX system interact with the Supplemental PC System

3.1 Scheme of the Interaction



4. Explanation of Supplemental System

On the previous page a reader could see the scheme of interaction between the Supplemental system and the UNIX system. Roles of the PC system are:

Scheduling

- Prepares and prints report Daily Schedule
- In interaction with a user determine formulations and number of batches or number of pounds needed for the next day production
- Reports ingredients and amounts needed to perform the next day production
- Reports whether inventory levels are sufficient for the production scheduled
- Calculates theoretical yield which is estimated for a formulation

Production Reporting

- Prepares and prints report Daily Production Report
- Reports ingredients and amounts used in production
- Calculates actual yield and trim for each formulation
- Prints production summary for a day with all production codes and yields at the plant

4.1 Scheduling Module

My intention here is to briefly describe how the scheduling module of the supplemental system works. In order to do it effectively I have made an attempt to visualize my explanation. On

the following pages a reader would be able to find printouts of computer screens for entering information to get reports about production schedule. On them I added comments to clarify interaction between a user and the system. What cannot be seen are "buttons" which anable a user to move from one screen to another as well as run the main procedure for production schedule. I named this section *"Supplemental System - Scheduling Module Input"*. I followed the same strategy to introduce the following three subtitles; reports for production schedule, production module input screens and production reporting.

4.2 Schedule Reporting

See Appendix B *"Supplemental System - Reports Schedule"*.

4.3 Production Module

Both input sections for production scheduling and production reporting have screens for liver lines and for group formulations. The reasons for separated entries come from the differences in manufacturing processes between these lines as well as diferences in reporting.

"Liver Lines Classes" have:

1. Only one ingredient
2. Meat is diced in production to a portion size
3. Meat used is reported in pounds

Group Formulation Classes have:

1. More than one ingredient
2. Number of codes which share a formulation can be one or more
3. Ingredients used are reported in batches
4. Group Formulations have more than one formulation option

See the appendix C *"Supplemental System - Production Module Input"*.

4.4 Production Reporting (Who, When, Why, What and How)

See Appendix D *"Supplemental System - Reports Production"*.

5. What one has to take in consideration when selling and conducting such a project

5.1 People Factors

Computer systems and information technologies in general are necessities of today's businesses. They could provide management with more accurate and on-line information which would allow more control and insight over the business as well as better customer service and awareness of customer needs and buying patterns.

In today's literature and discussions about business information systems there is a lot of highlights on forecasting and sales history though my experience has led me to view companies' information needs a little bit different. By saying that I primarily think that management people are looking for more control over the business. Many times when discussing goals of the project my customers would ask for the system which would straighten out their inventory and give them better insight over the cost structure, for example. They would all have had a sense of losing track of what is really going on in their organization and they want computers to help them out.

None of the managers was thinking about the control in a sense of "carrying a whip" above the employees' heads but he / she knew that an information system could detect or measure some parameters in business which would provide more insight and understanding. General feeling was that managers, supervisors and employees could learn something which would let them run the business better.

In majority of cases managers were aware of the fact that it is not just a computer and software to make the things happen but people who would adopt and use it and a person or persons in charge of maintaining them. *For a computer consultant or a computer developer it is very important to clarify to customers this when he / she is getting involved in such a project.* Any

software application is *a living thing* and in order to respond to business needs it would require some *kind of adjustment and improvement during its life time*. Knowingly that the information system at the current level doesn't have learning capabilities *only the human would be able to catch up with business complexity and not let the system become obsolete.*

Employees have tendency to view a computer system as a threat. In the first place they think it takes away from them some daily duties which make them important. In Nordic's case it was a simple calculation of ingredient demand. However, computers let people have more time to think and be involved in improving and correcting operations. Information from the computer system is detecting mistakes fast and let them improve operation performance, product quality and customer satisfaction. The path from the view that computers are "enemies" to employees to the point when they are adopted as useful assistants is the most important phase of the project.

A computer developer should know this in advance and communicate it with management in early phases of the project. *Crucial support for the system adoption must be coming from management side and without it the whole project could fail and the system could be abandoned.*

5.2 Dealing with "Resistance to Change"

I have read many articles in computer magazines about feasibility labs and friendly using application capabilities which were claimed as a key factor of application success. Undeniably it is of great importance and it can help to gain customer satisfaction but it doesn't play the major role. Friendly using systems are developed for people who are already computer users and who have used them for some time. For all of them "friendly features" such as cue cards would boost amount of work which they could get done daily as well as it would improve decision making processes through knowing and learning how to use advanced features and functions from the new version of the system quickly. My point is that just a friendly using system wouldn't help out a beginner.

Employees who should start using a computer in daily operations don't see benefits of computer systems at all. Many factors are in play; they are old enough not to accept this change and learn fast to substitute old working habits with computerized ones; they don't clearly see the benefit of doing so due to philosophy that they have done things the same way for such and such years and everything has been fine; and many others. It is really hard for them to change a frame of mind.

Management is aware of the barriers directly and indirectly. When I have discussed it with managers, many of them have expressed concerns about aging problem of their subordinates and computer adoption. They only attempted to point out employees in the organization who would resist the most. That has been a helpful lead for me to pay special attention to them. Overall feeling has been that the change would take time but it has to happen.. My intention here is to give some useful hints how to overcome barriers of system adoption.

A computer developer needs to get involved everybody who might be "affected" by the system, or in other words, everybody who would be a future user. Involvement doesn't simply mean that the one would interview everybody and collect as much information as possible! The computer system should emulate the way in which the company or department has been doing business as closest as possible. The reports should be similar in format and information to ones when the system wasn't there simply because everybody is used to them and everybody knows how to read them. The whole Nordic project was based on this strategy. A developer might realize that something would be better other way but he / she doesn't have to push with changes of any kind, immediately keeping in mind that computer system or change of the one which is in place is by definition big change enough. Such suggestions should be left for interim presentations and reports where consensus can be gained.

The new system should emulate what a company does, but faster and more acurately. Reports should be the same or similar so everyone would be able to find information easily. I

consider this as a first step of system adoption and inplementation. This would make everyone happy.

Though it might happen that a developer would need to spend more time talking with some supervisors then others, he / she must keep in mind that none of them would like to feel kept aside or less important. My advice if possible, frequently and informally let everybody know where the project stands, highlight her / his contribution or a comment made a week ago or even demonstrate quickly how it works. It might take ten minutes or half an hour but it would benefit the whole project tremendously! Catch people when taking a short break or having a coffee and show the look of a new report and ask them what do they think. It would not hurt but it would eventually take away worries about "that computer system the company is planning to get".

5.3 Selling the System to Management

In order to continually enhance the system acceptance and clarify some facts in the phase of system development, a developer should schedule interim presentation where most of the supervisors and managers should be present. It is very hard to find time which would be convenient to everyone but a developer must work it out. In addition, a developer must prepare the whole presentation the best way possible.

I always tend to create very informal atmosphere when a presentation occur. The whole conversation triggered during a presentation should be relaxing and the computer should sit equally visible and close to everyone. Everybody including myself is sitting. I let everyone, before a presentation starts, randomly pick his own chair. Everything I want to say and demonstrate I prepare in advance and deliver to everyone as an handout. Don't forget that most of people like to have a hard copy of everything. I usually turn handouts half an hour before the presentation for the reason that some people wants to see what to expect in advance. The hard copy has another purpose, people like to return their thoughts about the presentation with delay of hours or a couple of days. For a developer it is important to get input from everybody present at a presentation.

Different people respond differently, some of them instantaneously, some of them after they look at everything once again at home or after giving a thought in couple of days.

During presentation a developer should clearly explain what he / she wants to show before demonstrating it on the screen and also point out where the audience can find it in handouts. The whole rhythm of presentation should be moderate (definitely not fast!) knowing that everyone in the room is interested about the system. After each sequence of demonstration a developer should give some time where he / she can expect questions and comments. A developer should be able to take notes. At this point of the project a developer is familiar with the company's way of doing business. He / she knows who is interested in what modules which have been developed. Though he / she should try to get input from everyone at the organization, he / she should pay special attention to comments and responses coming from immediate users of patricular module. For example in the Nordic case, a supervisor who would be reporting about direct labor hours on production lines told me what would be the best way to do it. He suggested for direct labor to report in people and hours, and for overtime only in hours. I set the system that way.

Production supervisors and middle mangers tend to conform with superiors which are also present at the presentation. A developer must be able to identify the phenomena. In other words, it could happen that a supervisor, though in general not satisfied with the computer system performance, would not objetc to confirming general consensus from his superiors that the system development is on the right track which comes. A developer has to find a way and learn real opinions about the system, while in the developing phase of a project. Most of the time the system is used by supervisors and middle managers and top management is just getting reports on their desks. Developer success is dependent on what top management thinks and feels, but more than that his success relies on the users who would enter production or sales data and directly answer questions from the terminal.

If I would feel that a future user is not really comfortable speaking out in front of superiors I would try to get his / her opinion in informal conversations. Based on what I would learn I would inform everyone else, over the phone or in writitng, and propose some improvements.

Lastly, for any major decision affecting the system a developer should not push to hard and take one step at the time. The computer system or software solution could be a state of art could be really brilliant but it wouldn't guarantee that the whole project would succeed. Management people don't know software code and they wouldn't be impressed and happy if they don't see that system is doing what they want. A developer should express ideas and thoughts in simple words because computer vocabulary would add more confusion and hesitation. Software must be what the company wants and you should learn wants as soon as possible. A presentation is a real help to a developer to gain more insight in company's needs and a way for all future users to become more familiar with the system.

6. How to decide what to do when a small company needs Business Information System

6.1 How to choose the right software for business

Many small companies today have reached the point when they are considering purchasing an information system. As I stated a couple of times in this report reasons might be better control over inventory (inventory management), need for accurate pricing system, customer service or something else. Problems which follow the purchasing decision are numerous:

1. Aging employees which would slow down training process

2. A variety of packages available on the market

3. High pace of computer and software industry; How long before the system would become obsolete?

4. What vendor to go with and what technical support the company should expect in following years

5. How not to purchase a system which doesn't fit business practices?

Ideally, the company would have somebody inside who would know its business and at the same time have knowledge of information systems available on the market and is familiar with trends in the computer industry. In reality such a person is hard to find inside the company due to limited resources of all small businesses. I have encountered a few scenarios with companies which encountered such problems . My intention is to list and comment on them.

Frequently it has happened that an accountant would be the one to assign for contacting the computer companies or computer consulting firms. Reasons behind this are; the accountant is responsible for company's accounts so he / she would know what does the company needs; He /

she would need the system the largest portion of time etc. Though those assumptions are partially true it is hard to believe that the accountant's expertise would be sufficient to even screen prospective systems right.

Though an accountant might have a financial picture of the business it doesn't necessarily mean that he knows how the business operates and what the real information flow is between scheduling, production, inventory and delivery. He knows what he needs to get his portion of the job done. An accountant would find the system based on how it fits his / her needs the best.

When contacting the companies and asking questions about the systems a company repsesentative would for sure get lots of promises about what the system can do and do well. Considering that sales people could offer you and promise you everything you asked for, they are not a reliable source of information. My advice would be to somehow get information on what system cannot do! It might be cruical for the company. To get a good idea about the software company or a computer firm the person in charge should ask for a list of customers a vendor has dealt with and call some of them. Benefits might be:

1. to learn industry its information system is suitable for

2. to learn what kind of expriance a vendor has in providing buisness solutions

3. to learn how long vendor is in business

4. to call up the vendor's customers and to try to get an answer on the question: "What is it that you wish the system could do?".

Some businesses would go for the strategy which tells :"get the system which was purchased by the company's stiffest and larger competitor. Personally I have no problem with such a logic, but how would the small business would know that the competitor didn't make a mistake with its information system without a person in charge to decide?

6.2 Whom to place in charge to make a decision between options

My advice would be that a small business would sooner or later need somebody to maintain their system, operate computer network and make sure that the whole system operates smoothly on daily basis; in other words, live with it. Though it doesn't look affordable on the first glance to put another person on the payroll, in the long run it is much cheaper. A company which experienced one failure with its information system knows this really well. Frustration and abandonment of it teaches a lesson on how delicate the purchasing decision and system adoption might be. Having the person who would know the business and have necessary computer skills and knowledge seriously reduces the risk of project failure.

7. PCs as a Business Solution, Trends and Perspectives

Each year, advances in micro-chips, optoeletronics, and other building blocks make possible new products and services which brings more and more people into the Information Revolution. It is definitely changing the way we live as well as the way we are doing business.

Networks support spread at the first place when the high paced communication industry replaced a traditional computer and opened up new frontiers for business. As a result an isolated PC sitting on the desktop is almost abandoned. Microsoft Corporation on the PC software side of computer industry is moving more and more toward Windows NT by improving it and making it *affordable* to everybody. Looking at Microsoft's new strategy it is easy to conclude that the company is not content to be a vendor of desktop and departmental databases and other software packages, but it is trying to take a lead in client - server computing.

To really reach a corporate world where thousands of servers incorporate, several things must occur. Servers in use must be sophisticated, but not *too expensive*. They must be highly *compatible* with one another and supported with *reliable system administration* tools to manage such a complex network. Integration between databases and business applications have to be very tight. Microsoft is achieving it with its product line having Excel, Fox Pro, Visual Basic, Access etc.

Here I am talking about Microsoft due to its size and market power. Companies such as Novel and Sybase among others faces adjustments resulting from any move Microsoft does. Soon, we would be able to see moving of UNIX technology to Windows NT and desktop PCs, adapting to the lower pricing model set forth by Microsoft, low - end distribution channels built by

companies which have never done before and have never dreamed they would. I would say that all changes would be beneficial for a customer whether it would be an individual one or a business, both moneywise and performance wise.

Users would need to catch up with all technological changes and opportunities as soon as possible. Businesses and theirs employees should be able to take advantages in order to gain the edge on the market and among competitors. Though there is the whole service industry which offers courses, training and consulting for new software and upgrades Most users are lagging behind new software versions. I still encounter (under) utilization of computer technology in many businesses.

For instance, spreadsheet software which was originally developed as an analytical tool in business to help analyze collected data has been improved tremendously. Now it is on the level it could be a self - sufficient middle ranged data base with many automated procedures and modules with self-generated reports and graphs. One of prerequisites for getting the most of such a package is a programming language. Taking a closer look at any of "Office" packages on the market: MS Office, Borland Suit etc. uncovers exactly that. If you would want fully integrated computer environment containing a database, a word - processor, a spreadsheet, a presentation tool you would need to have some computer skills. Meaning of the phrase "some computer skills" would very likely be Visual Basic and basic knowledge of local area networks. I am afraid to answer the question whether the Visual Basic would be a standard requirement to get a job in the near future, but I do think it is possible.

My intention here is to highlight the gap which exists between the features of new software and capability of users to absorb them. Whether the gap would be broaden or narrow down it is hard to say. Computer software and hardwarecompanies have to cannibalize products within a year in order to stay on market and not to be eaten from competition, and users have to be able to

benefit from upgrades and computer wars. It seems to me that in reality users benefit from the low price but not from what they get. I have met many people who cannot distinguish a new version of software from an old version because they don't know what the new features are and how to use them. It has been hard for me to determine whether they would ever need new features beyond what they already know and use, or it is a lack of knowledge and training to become more profficient and efficient at the job place. Learning what is new takes time and business people not knowing how long it would take decide not to commit.

We are currently using the e - mail, sharing files over computer network, search data through the Internet, and enetring era of video conferencing. A sheet of paper and a pencil has been replaced with notebook computers, modems and printers heading to a virtual corporation. Very small percantage of businesses is taking full advantage of technology changes and the pace of computer industry. It should be a unifed effort from both sides, computer industry and business users to work out this intagible conflict.

8. REFERENCES

1. MICROSOFT EXCEL User's Guide

2. MICROSOFT EXCEL Visula Basic User's Guide

3. MICROSOFT EXCEL version 5.0 with Visual Basic Application language

Appendix A *"Old Reports in Nordic".*

NORDIC MEAT *INC.*

PRODUCTION SCHEDULE

DATE: 6-24-94

Maria	RAW MEAT ROOM	BOX	PRODUCT	SIZE	CASES	REMARKS
Stefan	CODE 962	NO	Meatballs	2 oz	250	2 oz Football Shape
Hydi	3564	RB $800	Meatballs	3/4 oz	150	3/4 oz Round
Deborah	960	NO	"	3/4 oz	125	3/4 oz Round
	5 @ 7.5					

Theresa	LIVER ROOM	BOX	PRODUCT	SIZE	CASES	REMARKS
Mani	CODE 5228	CB $900	SL Beef Liver	40/4	800	
Ashaunt	10 @	4.5				
Christina						
Estela	Rest					
David	Natasha					
Anthony	Press break					
Amen	down					

	STEW ROOM	BOX	PRODUCT	SIZE	CASES	REMARKS
5 @ 2	CODE Diced Beef					

Dorothy Jean	CUBE STEAK ROOM	BOX	PRODUCT	SIZE	CASES	REMARKS
Jesse	CODE 794	NO	SL Brk Chic Breasts	3/5 # Bags		
Travis	8 @ 7.5					
Le	4 @ 2					
Clyde						
Jamy Trinidad						

NOTE:

1 Finscha - Patricia 7.5

2

3 Michael Boxes - 2004

14

RAW MATERIAL REPORT
FORM. TIFF

DATE: 6-24-94

ITEM (962) Meatballs — NO. BATCHES 3

TOTAL WEIGHT	WEIGHT PER BATCH	DESCRIPTION	COST PER POUND	TOTAL COST	MISC.
1020	300	Fresh Cow Meat	1.07	1091.40	
420	180	FZN Cow Meat	1.18	495.60	
720	240	FZN Trimmings	.42	302.40	
120	40	CST	.37	44.40	
150	52	Bread Crumbs	.45	67.50	
120	40	Water	–		
95.25	31.75	Meatball Seasoning	1.93	183.83	
				2185.13	
2645		2529			
			.864		
			7.78		
			95.6%		

ITEM (3564) (960) Meatballs — NO. BATCHES 3

TOTAL WEIGHT	WEIGHT PER BATCH	DESCRIPTION	COST PER POUND	TOTAL COST	MISC.
180	60	FZN Cow Meat	1.18	212.40	
1080	360	FZN Trimmings	.42	453.60	
180	60	CST	.37	66.60	
36	12	Promasoy	.84	30.24	
24	8	DL 3952 Seasoning	2.47	59.28	
9	3	Salt	.20	1.80	
180	60	TVP	.60	108.00	
300	100	Water	–		
150	50	Diced Onions	.58	87.00	
76.50	25.50	4 cans Diced Green Peppers	.83	63.50	
				1082.42	
2316		2264			
			102.2%	.478	
				3.82	

ITEM _____ NO. BATCHES _____

TOTAL WEIGHT	WEIGHT PER BATCH	DESCRIPTION	COST PER POUND	TOTAL COST	MISC.

Daily Production Report

Date 1-6-94

	Total	Line Labor	Sup.Labor	Clean Up	Overtime
People	24	21	3	93.00	

#	LINE	LINE L.	Suport	Clen Up	Total/hrs	Avg./hr	Total $	Lbs. TOTAL	Labor/lb	Remarks
7	Raw Meat	42	8		50.0	$6.50	418.00	7510	.056	
7	Liver	52.5	7		59.5	$6.50	479.75	7310	.0666	
	Stew					$6.50				
7	Cube Steak	52.5	2		54.5	$6.50	447.25	1632	.274	
						$6.50				
21	Total/Day	147.0	17		164.0	$6.50	1345.00	16452	.082	

#	Product	Size	Code	Line	Yield	M.Cost	Labor	Pack.	Total	Remarks
1	Cube Stk	4oz	9511	Rm	95.8	.925	.056	.059	1.040	
2	Bf lunchcut	4oz	344	Rm	93.6	.481	.056	.055	.592	
3	Sl Cube Bf	4oz	304	Rm	92.9	1.048	.056	.059	1.163	
4	Pork lunch	4oz	9416	Rm	98.3	.884	.056	.059	.999	
5	Pork Cutlet	12#	0305	C	73.5	1.521	.274	.063	1.858	
6	Livers	3oz	2256	L	91.9	.424	.066	.045	.535	
7	"	4oz	5228	L	91.9	.424	.0666	.043	.533	
8	"	4oz	704	L	91.9	.424	.066	.043	.533	
9	"	3oz	703	L	91.9	.424	.066	.045	.535	

DAILY INVENTORY REPORT

DATE: 6-27-94

	CODE	PRODUCT		# OF CASES		
L	5228	Sl Beef Liver		403	403	
L	704	" " "		35	35	
L	703	" " "		20	20	
L	701-45	Beef Liver, E+P	45#	4	4	
L	701-1	" " " "	60#	2	2	
	794	Bnls Chix Breasts		199	199	
M	962	Meatballs	9#	281	281	
M	3564	"	8#	150	150	
M	960	"	8#	133	133	
	796			88	88	
S	1280			202	202	

Appendix #B *"Supplemental System - Scheduling Module Input*

Info Screen

INFO SCREEN FOR NORDIC PRODUCTION		
code number	454	ENTER CODE NUMBER
class number	4	
class name	Bridge Line - Single Breaded:	
formulation name	Italian Breaded Beef Pattie	
Enter Into Sheet:	GroupFormulationScheduled	

A user can enter a code number in this cell. If the code entered is in the system a user would get the product class number, product class name and a formulation name to which the code belongs. Even, a user would learn in what sheet to eneter data.

Figure 4.11 *Info Screen where a user might see to which class a code belongs to and check a formulation name.*

Liver Lines Scheduled Screen

[redacted]

Date: 7/2/94

Solid Cubed Beef Steaks:

	Product Classes:
1	Sliced Liver
2	Sliced Liver - Wrapped:
8	Diced Solid Meat:
10	Solid Cubed Beef Steaks:
11	Solid Cubed Pork Steaks:
13	Ground Meat:
17	Sliced Philly Meat:

A portion of a spreadsheet where a user is able to see what product classes could be processed in this sheet.

[redacted]

In this box a user is able to scroll through all codes which are currently in the system.

Liver Lines

Next To Do:

	1	2	3	4	5	6	7
Codes Control	ok!	ok!	ok!				
Group1 product codes:	2256	3890	5228				
Cases:	150	200	500				
Codes Control	ok!						
Group2 product codes:	300-5						
Cases:	35						
Codes Control	ok!						
Group3 product codes:	3814						
Cases:	160						
Codes Control							
Group4 product codes:							
Cases:							
Codes Control							
Group5 product codes:							
Cases:							

Codes Control is a friendly feature. When a code is entered in a cell bellow Codes Control confirms whether the code is present in the system showing: "OK!".Otherwise it prompts user to "re-enter". A user could use the scrolling box next to the table and determine a code number.

Figure 4.12 *Screen Spreadsheet for "Liver Lines" Product Codes*

Group Formulation Schedule

NOIGIR MEAT INC.

Group Formulations

Date: 7/2/94

Next To Do:

Sliced Philly Meat:

	Product Classes:
3	Bridge Line - Unbreaded:
4	Bridge Line - Single Breaded:
5	Bridge Line - Veal Parmesan:
6	Bridge Line - Double Breaded:
7	Pork Rolls & Veal Birds:
9	Diced Comminuted Meat:
12	V - MEG Comminuted Meat:
14	Tumbled Beef
15	Tumbled Pillow Pack Chicken Breast:
16	Tumbled Portion Pack Chicken Breast:
17	Sliced Philly Meat:
18	Purchased Goods:
19	Specialities:
20	Pot Roast:
21	Chicken Breast Cutlets:

	1	2	3	4	5	6	7
Codes Control	ok!						
Group1 product codes:	452						
Cases:	80						
Codes Control	ok!	ok!	ok!				
Group2 product codes:	333	334-t	334				
Cases:	70	233	120				
Codes Control	ok!	ok!					
Group3 product codes:	324	304					
Cases:	50	25					
Codes Control							
Group4 product codes:							
Cases:							
Codes Control							
Group5 product codes:							
Cases:							

A portion of a spreadsheet where a user is able to see what product classes could be processed in this sheet.

In this box a user is able to scroll through all codes which are currently in the system.

Codes Control is a friendly feature. When a code is entered in a cell bellow Codes Control confirms whether the code is present in the system showing: "OK!".Otherwise it prompts user to "re-enter". A user could use the scrolling box next to the table and determine a code number.

Figure 4.13 *Screen Spreadsheet for individual codes and group of codes with formulation*

Appendix C *"Supplemental System - Reports Schedule".*

Daily Ingredients To Use

7/2/94

Lot #	Food Items	Amount Needed	Quantaty on Hand	InventoryLevelAfterProduction
121-9	*Beef Trim 50/50*	2430.00 lbs	750.00 lbs	-1680.00 lbs
121-7cc	*Cow Meat*	2640.00 lbs	1000.00 lbs	-1640.00 lbs
121-95	*Stew Trim*	60.00 lbs	250.00 lbs	190.00 lbs
	Water	197.22 lbs	0.00 lbs	-197.22 lbs
123-19	*TVP*	78.33 lbs	400.00 lbs	321.67 lbs
123-20	*Promasoy*	13.43 lbs	200.00 lbs	186.57 lbs
123-26b	*Autolyzed Yiest*	4.48 lbs	200.00 lbs	195.52 lbs
123-23	*Batter 70 - 38*	44.05 lbs	1000.00 lbs	955.95 lbs
123-22	*Italian 41-32*	171.29 lbs	1000.00 lbs	828.71 lbs
1201-1	*Liver, Beef*	9659.09 lbs	1000.00 lbs	-8659.09 lbs
121-26	*Beef Blade Meat*	411.76 lbs	5000.00 lbs	4588.24 lbs

The system is automatically calculating ingredient totals needed for a day, getting a lot number used at the Unix system and reporting whether there is enough ingredients on hand to use formulations from the Daily Report Schedule. It also gives information about inventory levels which would be available after production.

Figure 4.22 ***Dialy Ingredients to Use for the products scheduled***

Daily Schedule Report

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS TO PRODUCE
Italian Breaded Beef Pattie	979 lbs	4	452	10 lbs	80	800 lbs
Lbs For Formulation	**800 lbs**					
Recommended Batches	1.00	Estimated Yield	81.73%			
INGREDIENTS	LBS./BATCH	TOTAL LBS				
Beef Trim 50/50	350 lbs	350 lbs				
Cow Meat	60 lbs	60 lbs				
Stew Trim	60 lbs	60 lbs				
Water	168 lbs	168 lbs				
TVP	78 lbs	78 lbs				
Promasoy	13 lbs	13 lbs				
Season DL - 3952	4 lbs	4 lbs				
Water	29 lbs	29 lbs				
Batter 70 - 38	44 lbs	44 lbs				
Italian 41-32	171 lbs	171 lbs				

On the top of the screen are information about the codes and number of cases to produce

Below are information about ingredients to use in the batch, number of batches, and an estimated yield.

If a product group has a formulation on the report would show "Recommended Batches", if codes belong to "Liver Lines" it would show "Lbs for Formulation"

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS TO PRODUCE
Cubed Beef Steak	660 lbs	3	333	10 lbs	70	700 lbs
		3	334-t	10 lbs	233	2330 lbs
		3	334	10 lbs	120	1200 lbs
Lbs For Formulation	**4230 lbs**					
Recommended Batches	6.00	Estimated Yield	106.82%			
INGREDIENTS	LBS./BATCH	TOTAL LBS				
Beef Trim 50/50	300 lbs	1800 lbs				
Cow Meat	360 lbs	2160 lbs				

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS TO PRODUCE
Sliced Cubed Beef Steak	700 lbs	3	324	10 lbs	50	500 lbs
		3	304	10 lbs	25	250 lbs
Lbs For Formulation	**750 lbs**					
Recommended Batches	1.00	Estimated Yield	107.14%			
INGREDIENTS	LBS./BATCH	TOTAL LBS				
Beef Trim 50/50	280 lbs	280 lbs				
Cow Meat	420 lbs	420 lbs				

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS PRODUCED
Sliced Liver		1	2256	10 lbs	150	1500 lbs
		1	3890	10 lbs	200	2000 lbs
		1	5228	10 lbs	500	5000 lbs
Lbs For Formulation	**8500 lbs**					

4.21 Daily Report Scheduled with all necessary production information

Appendix D *"Supplemental System - Production Module Input"*

Info Screen

INFO SCREEN FOR NORDIC PRODUCTION		
code number	454	ENTER CODE NUMBER
class number	4	
class name	Bridge Line - Single Breaded:	
formulation name	Italian Breaded Beef Pattie	
Enter Into Sheet:	GroupFormulationScheduled	

A user can enter a code number in this cell. If the code entered is in the system a user would get the product class number, product class name and a formulation name to which the code belongs. Even, a user would learn in what sheet to eneter data.

Figure 4.31 *Info Screen where a user might see to which class a code belongs to and check a formulation name.*

Liver Lines Report Screen

Liver Lines

Date: 7/2/94

Next To Do:

Solid Cubed Beef Steaks:

	Product Classes:
1	Sliced Liver
2	Sliced Liver - Wrapped:
8	Diced Solid Meat:
10	Solid Cubed Beef Steaks:
11	Solid Cubed Pork Steaks:
13	Ground Meat:
17	Sliced Philly Meat:

	1	2	3	4	5	6	7	lbs used
Codes Control	ok!	ok!	ok!					
Group1 product codes:	2256	3890	5228					
Cases:	150	200	500					
Codes Control	ok!							
Group2 product codes:	300-5							
Cases:	35							
Codes Control	ok!							
Group3 product codes:	3814							
Cases:	160							
Codes Control								
Group4 product codes:								
Cases:								
Codes Control								
Group5 product codes:								
Cases:								

A portion of a spreadsheet where a user is able to see what product classes could be processed in this sheet.

In this box a user is able to scroll through all codes which are currently in the system.

After production is completed a user gets the same screen as it is for scheduling, but in addition he/she has to enter number of pounds used

Codes Control is a friendly feature. When a code is entered in a cell bellow Codes Control confirms whether the code is present in the system showing: "OK!".Otherwise it prompts user to "re-enter". A user could use the scrolling box next to the table and determine a code number.

Figure 4.32 *Screen Spreadsheet for "Liver Lines" Product Codes*

Group Formulation Report Screen

Group Formulations

Date: 7/2/94

Next To Do:

Sliced Philly Meat:

	Product Classes:
3	Bridge Line - Unbreaded:
4	Bridge Line - Single Breaded:
5	Bridge Line - Veal Parmesan:
6	Bridge Line - Double Breaded:
7	Pork Rolls & Veal Birds:
9	Diced Comminuted Meat:
12	V - MEG Comminuted Meat:
14	Tumbled Beef
15	Tumbled Pillow Pack Chicken Breast:
16	Tumbled Portion Pack Chicken Breast:
17	Sliced Philly Meat:
18	Purchased Goods:
19	Specialities:
20	Pot Roast:
21	Chicken Breast Cutlets:

	1	2	3	4	5	6	7	Batches Used
Codes Control	ok!							
Group1 product codes:	452							
Cases:	80							
Codes Control	ok!	ok!	ok!					
Group2 product codes:	333	334-t	334					
Cases:	70	233	120					
Codes Control	ok!	ok!						
Group3 product codes:	324	304						
Cases:	50	25	!					
Codes Control								
Group4 product codes:								
Cases:								
Codes Control								
Group5 product codes:								
Cases:								

After production is completed a user gets the same screen as it is for scheduling, but in addition he/she has to enter number of batches used

A portion of a spreadsheet where a user is able to see what product classes could be processed in this sheet.

In this box a user is able to scroll through all codes which are currently in the system.

Codes Control is a friendly feature. When a code is entered in a cell bellow Codes Control confirms whether the code is present in the system showing: "OK!".Otherwise it prompts user to "re-enter". A user could use the scrolling box next to the table and determine a code number.

Figure 4.33 *Screen Spreadsheet for individual codes and group of codes with formulation*

Appendix E *"Supplemental System - Production Reports"*

DAILY LABOR PRODUCTION REPORT

Labor Cost per Hour:		$7.00	NORDIC MEAT INC.				Date:	9/27/93
		People:		Hours available:	%	Daily cost:	%	Total:
Line Labor		24	7.50	180.00	81.82%	$1,344.00	64.91%	
Overtime								
Support Labor		3	7.00	21.00	9.55%	$451.50	21.81%	
Clean-up.		3	6.33	18.99	8.63%	$275.00	13.28%	
TOTAL		30		219.99	100.00%	$2,070.50	100.00%	

LABOR REPORT PER CLASS OF PRODUCTION GROUP

		LINE LABOR			OVERTIME					
	Product Class:	People	Hours	%	Hours	%	Total:	%	Lbs. Produced:	Labor/lbs.
1	*Sliced Liver:*	8	*7.50*	38.10%			$797.6	43.61%	7740.00 lbs	$0.1031
2	*Sliced Liver - Wrapped:*									
3	*Bridge Line - Unbreaded:*	5.5	*7.50*	26.19%			$530.266	28.99%	4950.00 lbs	$0.1071
4	*Bridge Line - Single Breaded:*	1.5	*7.50*	7.14%			$128.029	7.00%	1010.00 lbs	$0.1268
5	*Bridge Line - Veal Parmesan:*									
6	*Bridge Line - Double Breaded:*									
7	*Pork Rolls & Veal Birds:*									
8	*Diced Solid Meat:*									
9	*Diced Comminuted Meat:*									
10	*Solid Cubed Beef Steaks:*	2	*7.50*	9.52%			$121.101	6.62%	330.00 lbs	$0.3670
11	*Solid Cubed Pork Steaks:*	4	*7.50*	19.05%			$251.960	13.78%	860.00 lbs	$0.2930
12	*V - MEG Comminuted Meat:*									
13	*Ground Meat:*									
14	*Tumbled Beef:*									
15	*Tumbled Pillow Pork Chicken Breast:*									
16	*Tumbled Portion Pork Chicken Breast:*									
17	*Sliced Philly Meat:*									
18	*Purchased Goods:*									
19	*Specialities:*									
20	*Pot Roast:*									
21	*Chicken Breast Cutlets:*									
	TOTAL:		*157.50*	100.00%			$1,829.00	100.00%	$14,890.00	$0.1228
	CONTROL									

A user enters information at the top table in the sheet, and enters people and hours per product class for a day. The system calculates pounds produced and labor cost per pound produced.

4.41 Daily Labor Production Report

Daily Report

This report resembles to the Daily Schedule Report and in addition it provides information about formulation meat cost per pound produced.

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS PRODUCED
Sliced Liver		1	2256	10 lbs	152	1520 lbs
		1	3890	10 lbs	204	2040 lbs
		1	5228	10 lbs	255	2550 lbs
		1	706	10 lbs	35	350 lbs
		1	705	10 lbs	6	60 lbs
		1	704	10 lbs	46	460 lbs
		1	703	10 lbs	76	760 lbs
Lbs For Formulation	7740 lbs					
Number of Pounds Used	8786.00 lbs					

INGREDIENTS	LBS./BATCH	TOTAL LBS	Cost per Lbs	Total Cost
Liver, Beef	8786 lbs	8786 lbs	$ 0.41	$ 3,602.26
Yield for Group	*88.09%*		MeatCost per LBS	$ 0.465

The system recognize codes which are trim and calculates trim for group where it exists.

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS PRODUCED
Pork Cutlets		11	3814	10 lbs	74	740 lbs
			3822	10 lbs	12	120 lbs
			PHT	1 lbs	276	276 lbs
Lbs For Formulation	860 lbs	*Trim for Group*	276			
Number of Pounds Used	1170.00 lbs					

INGREDIENTS	LBS./BATCH	TOTAL LBS	Cost per Lbs	Total Cost
Pork Caushion Fresh	1170 lbs	1170 lbs	$ 1.12	$ 1,310.40
Yield for Group	*73.50%*		Trim for Group	*23.59%*

MeatCost per LBS $ 1.164

FORMULATION NAME	BATCH SIZE	CLASS	CODE	LBS/BOX	CASES	LBS PRODUCED
Italian Breaded Beef Pattie	875 lbs	4	452	10 lbs	101	1010 lbs
Lbs For Formulation	1340 lbs					
Batches Used	1.00					

INGREDIENTS	LBS./BATCH	TOTAL LBS	Cost per Lbs	Total Cost
Beef Shank	60 lbs	60 lbs	$ 1.16	$ 69.60
Beef Trim 50/50	360 lbs	360 lbs	$ 0.41	$ 147.60
Water	150 lbs	150 lbs		$ -
TVP	70 lbs	70 lbs	$ 0.60	$ 42.00
Promasoy	12 lbs	12 lbs	$ 0.84	$ 10.08
Autolyzed Yiest	4 lbs	4 lbs	$ 2.47	$ 9.88
Water	26 lbs	26 lbs		$ -
Batter 70 - 38	39 lbs	39 lbs	$ 0.33	$ 12.99
Italian 41-32	153 lbs	153 lbs	$ 0.43	$ 65.82
Yield for Group	*105.96%*		MeatCost per LBS	$ 0.654

4.42 Daily Production Report with yields, trims and cost of ingredients per formulation

Daily Ingredients Used

7/3/94

Lot #	Food Items	Amount Used	Cost Per LBS	Total Cost	Quantaty on Hand	InventoryLevelAfterProduction
1201-1	*Liver, Beef*	8786.00 lbs	$0.41	$ 3,602.26	1000.00 lbs	-7786.00 lbs
121-15e	*Pork Caushion Fresh*	1170.00 lbs	$1.12	$ 1,310.40		-1170.00 lbs
121-26	*Beef Blade Meat*	390.00 lbs	$1.33	$ 518.70	5000.00 lbs	4610.00 lbs
121-9	*Beef Trim 50/50*	1780.00 lbs	$0.41	$ 729.80	750.00 lbs	-1030.00 lbs
121-7cc	*Cow Meat*	2700.00 lbs	$1.19	$ 3,213.00	1000.00 lbs	-1700.00 lbs
	Water	201.30 lbs		$ -		-201.30 lbs
123-19	*TVP*	80.00 lbs	$0.60	$ 48.00	400.00 lbs	320.00 lbs
123-20	*Promasoy*	13.70 lbs	$0.84	$ 11.51	200.00 lbs	186.30 lbs
123-26b	*Autolyzed Yiest*	4.60 lbs	$2.47	$ 11.36	200.00 lbs	195.40 lbs
123-23	*Batter 70 - 38*	44.98 lbs	$0.33	$ 14.84	1000.00 lbs	955.02 lbs
123-22	*Italian 41-32*	174.93 lbs	$0.43	$ 75.22	1000.00 lbs	825.07 lbs
121-95	*Stew Trim*	60.00 lbs	$0.45	$ 27.00	250.00 lbs	190.00 lbs
						950.00 lbs
						997.00 lbs
						-780.00 lbs
						-230.00 lbs
						-78.00 lbs
						-55.00 lbs
						-325.00 lbs

System calculates ingredient totals used for a day of production based on what is reported. It assignes the lot number and the cost per pound from the inventory file and calculates total cost per ingredient per day.
The lot numbers and quantaties are then enetered into the Unix system. (See the scheme of interaction, Chapter 3.1). It also reports a new quantaty on hand available.

Figure 4.43 *Daily Ingredients Used Report*

Daily Product - Cases Sheet

Date:

7/2/94

Total Lbs. Produced:	15166 lbs
Total Cases Produced:	1765

Overall plant performance for a day of production of codes palced into the inventory. The total code cost per pound produced is entered to the Unix system. Information from this sheet are kept for a weekly and a periodical report.

class	code	cases produced	portion size	box weight	Lbs. produced	YI	TI	Meat C	Packagi	Labor Cost/Lbs	Total Cost
1	2256	152	3.00 oz	10 lbs	1520 lbs	88.09%		$0.47	$ 0.040	$0.1031	**$0.6085**
1	3890	204	6.00 oz	10 lbs	2040 lbs	88.09%		$ 0.465	$ 0.030	$0.1031	**$0.5985**
1	5228	255	4.00 oz	10 lbs	2550 lbs	88.09%		$0.47	$ 0.040	$0.1031	**$0.6085**
1	706	35	6.00 oz	10 lbs	350 lbs	88.09%		$0.47	$ 0.030	$0.1031	**$0.5985**
1	705	6	5.00 oz	10 lbs	60 lbs	88.09%		$ 0.465	$ 0.040	$0.1031	**$0.6085**
1	704	46	4.00 oz	10 lbs	460 lbs	88.09%		$ 0.465	$ 0.040	$0.1031	**$0.6085**
1	703	76	3.00 oz	10 lbs	760 lbs	88.09%		$ 0.465	$ 0.040	$0.1031	**$0.6085**
11	3814	74	4.00 oz	10 lbs	740 lbs	73.50%	23.59%	$ 1.164	$ 0.0500	$0.367	**$1.5813**
11	3822	12	3.00 oz	10 lbs	120 lbs	73.50%	23.59%	$1.16	$ 0.0600	$0.367	**$1.5913**
11	PHT	276		1 lbs	276 lbs	73.50%	23.59%	$ 1.120			**$1.1200**
10	300-5m	33	5.00 oz	10 lbs	330 lbs	84.62%		$1.57	$ 0.0600	$0.293	**$1.9248**
4	452	101	2.70 oz	10 lbs	1010 lbs	105.96%		$0.65	$ 0.0600	$0.127	**$0.8410**
3	333	70	3.20 oz	10 lbs	700 lbs	105.56%		$0.79	$ 0.060	$0.107	**$0.9586**
3	334-t	233	4.00 oz	10 lbs	2330 lbs	105.56%		$0.79	$ 0.060	$0.107	**$0.9586**
3	334	115	4.00 oz	10 lbs	1150 lbs	105.56%		$0.79	$ 0.060	$0.107	**$0.9586**
3	324	50	4.00 oz	10 lbs	500 lbs	104.05%		$0.98	$ 0.060	$0.107	**$1.1456**
3	304	27	4.00 oz	10 lbs	270 lbs	104.05%		$0.98	$ 0.060	$0.107	**$1.1456**

4.44Daily Report with codes and total cost per pound produced

PRESENTATION OUTLINE - Part1

UNIVERSITY OF KANSAS
SCHOOL OF ENGINEERING

FIELD PROJECT PRESENTATION

PCs IN BUSINESS ENVIRONMENT

by

Mijo T. Colak

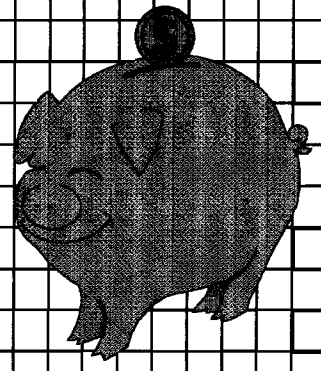
July 19, 1994

Presentation Outline

- How Production in Nordic Works
  - Production Schedule
  - Production
    - Production Rooms
    - Production Lines and Production Classes
    - Labor Classification
  - Production Reporting
- UNIX and PC Interaction
- Demonstration of Supplemental System
- Barriers to conduct a computer project
- Trends in Computer Industry
- Comments, Questions ....

PRODUCT REQUIREMENTS:

- PERCENTAGE OF FAT
- PORTION SIZE
- MEAT / NON-MEAT RATIO
- BREADING / (MEAT+NON-MEAT) RATIO

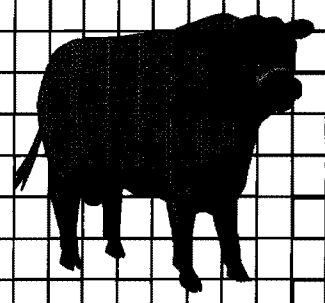


PRODUCTION TERMS:

- YIELD - Ratio between total pounds produced to total pounds used for formulation
- TRIM - Meat byproducts which cannot be sold at the price, but which could be reused or sold for less.
- SHRINK - Other then products and trim
- PRODUCT CLASS - Group of products which is manufactured on the same line. They differ in direct labor involvement.
- Product Formulation - Formulation (meat, non-meat and breading) for a group of products which may differ in portion size.
- Product Line - manufacturing process for a product class.
- Product Code - a product with code number for the UNIX system.

BATCH COMPOSITION:

- MEAT PORTION
- NON-MEAT PORTION
- BREADING PORTION

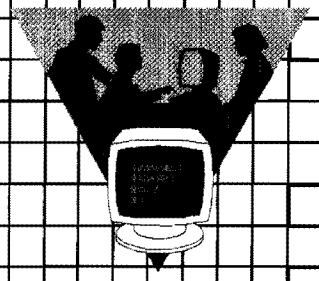


Production Scheduling - Overview

- **Objectives**
  - determine products (codes) to produce
  - determine formulations (ingredients) to use in production
  - determine "theoretical" yields for formulations scheduled
- **Constraints**
  - ingredients available on hand
  - product specs (percentage of fat, portion size)
  - direct labor employees

Production Scheduling -

- Spreadsheet For Formulation Options
- Software Demonstration
- Reports

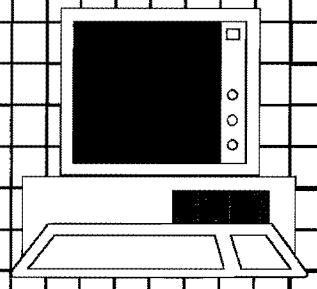


PRODUCTION REPORTING

- PRODUCT CODES PLACED IN INVENTORY
- YIELDS FOR FORMULATIONS
- TOTAL OF INGREDIENTS USED
- PRODUCT CODE COST
  - LABOR COST
  - PACKAGING COST
  - INGREDIENT COST

PRODUCTION REPORTING

- Software demonstration
- Reports

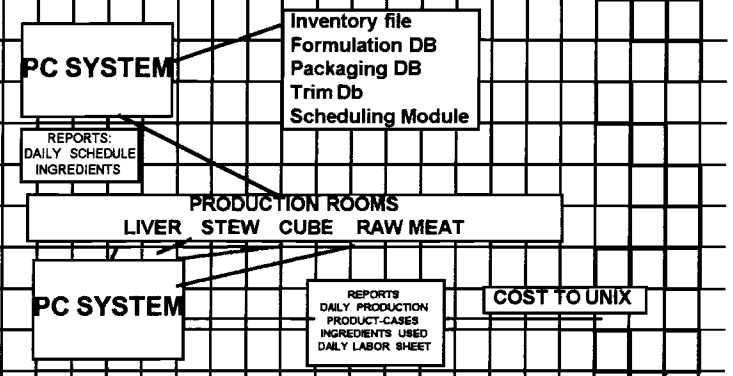


PRESENTATION OUTLINE - Part2

INTERACTION WITH UNIX SYSTEM

- UNIX DOES:
  - KEEPS INFORMATION ABOUT ORDERS
- PC BASED SYSTEM DOES:
  - SCHEDULING
  - PRODUCTION REPORTING
  - PRODUCTION COST
  - FORMULATION & YIELD TRACKING
  - RETURNS TO UNIX PRODUCT CODE COST OF INGREDIENT

INTERACTION WITH UNIX SYSTEM - SCHEME



WHAT HAS CHANGED?

- TOTAL COST PER POUND PRODUCED CALCULATION
  - DIRECT LABOR COST IS DETERMINED BASED ON PRODUCT CLASS INSTEAD OF PRODUCTION ROOM
    - 11 PRODUCT CLASSES VS. 4 PRODUCTION ROOMS
- INGREDIENT COST FOR FORMULATION REDUCED FOR TRIM COST
- FORMULATION OPTIONS ARE CONSISTENT AND PRODUCTS HAVE PERCENTAGE OF FAT REQUIREMENT WITHIN 1%
- TIME INVOLVED IN DAILY CALCULATIONS IS REDUCED AND ACCURACY OF REPORTS IS INCREASED
- YIELD TRACKING PER CODE OR FORMULATION OR CLASS ENABLED
- FURTHER IMPROVEMENTS AND UPGRADES

COMPUTER PROJECT ANGLES

- MANAGEMENT NEEDS:
  - BETTER CONTROL OVER BUSINESS OPERATIONS
  - BETTER INSIGHT OF BUSINESS OPERATIONS
  - INCREASED ACCURACY OF REPORTING
  - BETTER QUALITY OF INFORMATION ON REPORTS
  - MORE USEFUL DATA ON REPORTS
  - IMPROVED DECISION MAKING PROCESS
- SUBORDINATES' THINKING
  - RESISTANCE TO CHANGE
  - THREAT OF COMPUTER AS SOMETHING UNKNOWN
  - THREAT THAT COMPUTER IS TAKING AWAY THEIR JOBS
  - DEFENSIVE TO NEW REPORTS
  - DON'T LIKE MORE CONTROL OVER THEM

DEALING WITH BARRIERS

- INVOLVE EVERYONE AND INFORM EVERYONE
- ORGANIZE PRESENTATIONS
- INFORMAL CONVERSATIONS
- ASK FOR SUPPORT FROM UPPER MANAGEMENT
- SPEND MORE TIME WITH OLDER EMPLOYEES
- IMPLEMENT PROJECT IMPROVEMENTS ONE STEP AT THE TIME
- BUILD COALITION WITH EMPLOYEES WHO ARE WILLING TO ADOPT COMPUTER FASTER

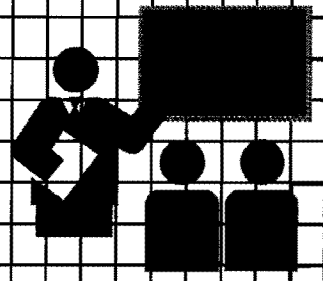
THE RIGHT SYSTEM FOR MY BUSINESS?

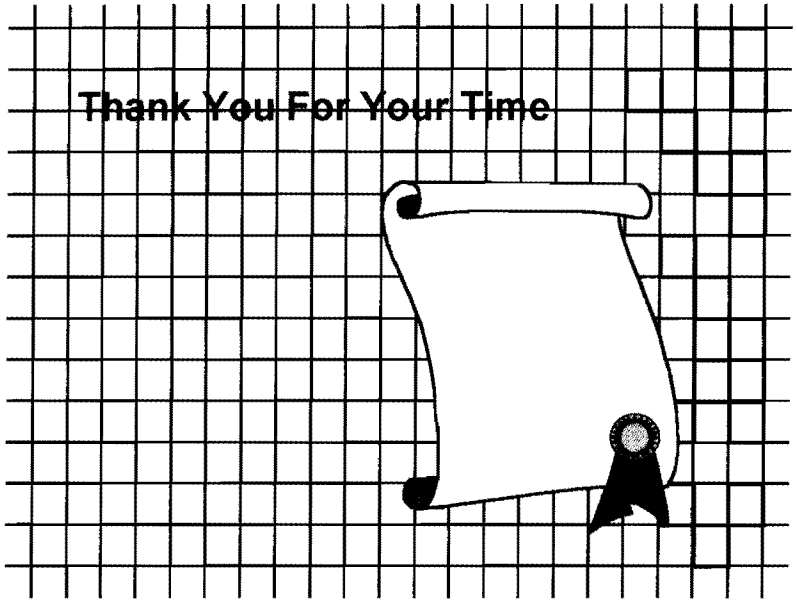
- DEFINE BUSINESS NEEDS
- CHECK COMPETITORS AND THEIR SYSTEMS
- CALL UP SOFTWARE VENDORS
- CHECK ON SOFTWARE VENDORS
  - How long they are in business?
  - Who are their customers? ... Call some of them
  - What industry they are in?
  - What their software cannot do?
- CAN YOU AFFORD A COMPUTER PERSON?

PCs, TRENDS & PERSPECTIVES

- HIGHLY COMPETITIVE INDUSTRY
  - COMPANIES CANNIBALIZE THEIR PRODUCTS TO STAY N BUSINESS
- COMPUTER NETWORKS
  - VIRTUAL CORPORATION
  - VIDEO CONFERENCING
  - NTERNET etc..
- PLAYERS: MICROSOFT, NOVEL
- ELECTRONIC REPORTING
- POCKET PC

COMMENTS, QUESTIONS ....




Thank You For Your Time