CHAPTER 3
INDUSTRIAL ENGINEER
AS A MANAGER

TUNING IN:

Current role of industrial engineering manager is

Expected to be excellent in technical skills as well as being a coach, trainer, mentor and facilitator. The focus is on human, technology and processes which leads to Value Added Work .

Value added work is
- Working on the right things
- Doing the right things at the right time
- Doing it right the first time
- Solving customer's problems

Challenges for Industrial Engineers are:
- Setting goals and establishing priorities
- Management and motivational style
- New data
- A new sense of urgency
- People problems
- Creating alternative solutions
- Delegating and working through others
- Process versus content

What is your personal management style? (M)

Why does the personal style of some people affect us negatively as soon as we meet them? We know that these particular relationships will be difficult and that we will have to be careful with what we say and what we do. The chemistry is wrong somehow. We all carry a basic behaviour pattern inside us. Whatever its causes – genetics, upbringing, astrology – it affects the way other people see us and the way we relate to others. Many impersonal conflicts at work are caused by a lack of awareness of these patterns.

As managers of people, we need to know our own personal style and how it affects others. But that is not enough. We also need to quickly recognise the personal styles of the people we have to work with so that we can deal with them appropriately. [4]

Assessment of personal styles

To assess your own personal management style circle in the words which you think describe your behaviour at work.

Player[1]	creative	outgoing[2]	agreeable[3]	supportive[4]	Pleaser[5]
	enthusiastic	excitable	reliable	willing	
	ambitious	intense[6]	concerned	cooperative	
	inspiring	emotional	friendly	helpful	
	takes risks	people-oriented	modest[7]	likes stable relationships	
	fun-loving	future-oriented	likes shared responsibility	doesn't like risks	
	decisions based on intuition	pro-active	tends to minimize personal conflicts	time is less important than people	
	friendly	stimulating	warm	approachable	
Pusher[8]	dominant	independent	organized	analytical	Processor[9]
	practical	determined	serious	critical	
	decisive[10]	hard	distant	thoughtful	
	effective	demanding	detailed	persistent[11]	
	result-oriented	take the initiative	past-oriented	quality-conscious	
	unemotional	takes control	reserved	logical	
	present-oriented	demand of new ideas	love of fact and figures	believes in principles	

Then check in which of the four quarters you have circled the largest and the second largest number of words. Now you are in a position to discover either you are a Processor, a Pusher, a Pleaser or a Player. Then see whether you have a strong secondary style which influences your behaviour too. Who is reactive or proactive, task-oriented or people-oriented?

You can also use this exercise to check how other people see you. Using the photocopy of the table on this page, ask one or more of your colleagues who know you well to circle the words they think apply to you. Do their assessments match your own?

The next step is to recognise the style of those you work with, especially those who *rub you up the wrong way*[12]. Players and Processors have problems with each other, as do Pushers and Pleasers. The sooner we recognise the style of others, the sooner we can build the temporary platform on which to do business with them. There are three main ways to recognise a person's style. [4]

	1) Non-verbal signals.	2) Use of language	3) Appearance and workspace
Player	Players and Pleasers smile more than the others	Players often use exaggerations like "great", "superb", "brilliant". They often speak quickly and with emphasis. They talk about feelings, personal background and they like to talk about themselves. Players use small talk in order to build a relationship and to create a positive feeling and to get on the same wavelength before getting down to business.	Players tend to dress stylishly and are concerned about their appearance. Their workspace is often chaotic, often containing photos of themselves.
Pleaser	Pleasers and Players are more likely to look for physical contact when talking to you	Pleasers ask lots of questions and like to get the others talking about themselves. They tend to use inclusive language like "we", "us", "together", "our".	Pleasers dress more casually or conform to the expectations of the organisation. Their workspace often contains family pictures and personal *mementoes*[13]. It is often a bit *untidy*[14].
Pushers	Pushers and Pleasers generally have intense eye-contact. Processors and Pushers need more personal space	Pushers' way of speaking is quick and to the point. They tend to make statements rather than ask questions, avoid small talk and use more formal language. They use words like "result", "efficient", "goal", and "action". They sometimes end your sentences for you.	Pushers like a clear desk policy. Their appearance is businesslike, and they aren't very fashion conscious. Their workspace looks functional.
Processors	Processors are more serious in appearance and don't gesture as much as Players	Processors aren't very talkative. They usually speak only when they have something to say. Then it's often factual. They speak more slowly than Players, often pausing to formulate their thoughts. They use words like "logical", "systematic", "firstly...", "secondly...".	Processors dress conservatively. Their workspace is organised. There may be a lot of documents, but they are in tidy *piles*[15]. There are few or no personal items.

MANAGING MANUFACTURING OPERATIONS IN THE 1990'S

By William P. Hakanson of the Manufacturing Execution Systems Association

Manufacturers both in the U.S. and abroad have recently been in a fiercely competitive race against time. It is a race to respond faster to customers while reducing costs and improving quality. It is a race in which the only winning strategy is to do it right the first time. The winners get to keep market share. The losers do not. To compete successfully, the manufacturer must know exactly what is happening in the plant and be able to act on it. The closer to real-time this information, the better the manufacturer's ability to compete and respond.

Among the software tools to help manufacturers with this real-time challenge are powerful planning packages, including MRP, MRP II and the newly emerging COMMS. While quite effective in capturing history, inventory, material needs and other static information, these systems do not provide the kind of dynamic and interactive feedback or proactive approach that today's competitive environment demands. Once the production cycle has begun, it is difficult to obtain any information at all on that job using planning software.

According to Tony Friscia, president of Advanced Manufacturing Research (AMR), Cambridge, Mass., a group that analyzes trends in manufacturing software, "the traditional MRP systems do not deal with changes very dynamically."

Enter manufacturing execution systems (MES). As the name suggests, this high-level software is able to track and manage all aspects of the job while it is in the execution phase or in process. MES bridges the gap between planning and control, enabling the user to know exactly what is happening on the shop floor at any point in the production cycle. Data is available in real-time, allowing adjustments to be made to a job while it is running, thereby preventing problems that are often discovered too late to correct.

For the manufacturer who is grappling with the fierce competition in today's marketplace, it is imperative to be able to collect and analyze data in real time. Manufacturers must make strategic business decisions every day. As the margin of error shrinks, the need to base those decisions on current information grows.

What an MES can do that traditional software cannot

With the multitude of software floating around in an alphabet soup of acronyms, it is difficult to maintain a functional perspective. However, there are certain elements of execution systems that differentiate them from other types of manufacturing software.

MES technology has evolved in response to customer demand. The resulting product is now referred to as integrated MES. It includes tools like resource management, capacity scheduling, maintenance management, product distribution, statistical quality control, laboratory information management, process management, data collection, plant-wide document management and process optimization. An MES is driven by the product generation, rather than by the manufacturer's planning needs or customer demands. By uniting these elements of the manufacturing process, MES technology gives a full picture of the product and all that affects it as it moves toward the customer.

AMR is the group that coined the term "MES." They define the presence of a relational database with real-time information integration as a core component of the MES. The other plant-wide applications that integrate around or are driven by the core of real-time information is what makes an MES so effective. Similar to AMR's MES is the Gartner Group's, Stamford, Conn., manufacturing operation management systems (MOMS).

There is a movement to integrate or include planning and business management functions in the MES. Some will seamlessly integrate with already-in-place planning systems on one end and provide getaways to EDI linkages to customers on the other.

According to Julie Fraser, AMR's senior industry analyst, "MES is one of the most valuable software innovations to become available to manufacturing enterprises in recent years."

The Gartner Group's John Borelli, vice president and service director for computer-integrated manufacturing, describes the technology as "a proactive tool or system for the plant manager to bring a chaotic, real-time environment into balance."

For many manufacturers, MES can typically reduce the time-to-market, improve productivity, enhance quality and lower costs. For those in regulated industries such as pharmaceuticals, defense or those needing to comply with ISO 9000, MES is practically a requirement to produce the necessary tracking and reports.

Borelli adds, "Regulation is only going to increase. It will be important for (the manufacturer) to get ahead of the regulatory treadmill. If they can get beyond the regulation (or information gathering) and develop an understanding of the process, they will be ahead of the game."

Far more than real-time information

As manufacturers strive to reduce lot sizes and get more product variations out of existing processes, they also need to have far greater agility and flexibility in controlling the process. That is where the MES shines. The MES is about controlling change within the plant. As a system, it acts as an agent for change, and it is quite clear that the plant that can adapt to change will win in the marketplace.

More than just an information vehicle for MRP, MES becomes a virtual report card on every aspect of the manufacturing process — even to the extent of providing feedback into the design engineering process. As manufacturing, engineering and product design converge, the information and control provided by an MES contributes to the improvement of not only the things manufactured, but the way in which they are manufactured.

U.S." NUMMI's workforce, however, was not quite satisfied and challenged themselves to do better. They use software from Hewlett-Packard, Palo Alto, Calif., to help them achieve greater agility on their new light truck painting and finishing line, one of their largest operations. The system provided real-time interface between information and control.

Now maintenance and production team members can call up relevant information anywhere on the plant floor. Armando Ablaza, maintenance assistant manager says, "Today we can see our efficiency immediately and focus right on it." NUMMI has become a more lean and agile plant and much of that is due to the real-time information availability that Hewlett-Packard has helped them achieve.

Power to the people

Personal accountability and employee empowerment are also themes being discussed in boardrooms and on business pages across the nation. It is agreed that given greater accountability, workers will also become more productive.

The Microelectronics Packaging Systems (MPS) department of Texas Instruments, Dallas, Texas, is responsible for a wide range of electronic technologies. Among them are surface-mount printed wiring boards, multi-chip fabrication, thick-film substrate fabrication and focal plane array detection systems. The MES they acquired from Promis Systems Corp., San Jose, Calif., has "proved to be an enabling technology" that has increased and advanced workers' understanding of responsibility cause and effect. David Counts, manager of MPS factory systems says that prior to the MES implementation, a traditional management structure existed, where managers oversaw specific areas of the plant. He comments, "that has changed dramatically."

Under the new system, the factory supervisors have become facilitators for teams that direct themselves, with individuals who are responsible for things like external contact with the customer. "To a large extent, the management structure has become a marketing function. Instead of managing internal operations, we've turned external, allowing us to focus on our customers. As for the individual production workers...before all they focused on was the work placed in front of them. Now they are responsible for scheduling their own work and for its quality."

Even among those who have not yet seen the hard numbers, there is a confidence that this approach to global competitiveness will pay off. Sun Chemical Corp., Fort Lee, N.J., recently installed an MES from Andersen Consulting, Chicago, Ill., in over 50 plants in its largest North American division. "The system will enhance our customer service capabilities by improving communication and information exchange among our many facilities," says Massie Odiotti, Sun Chemical senior vice president and general manager. He adds, "By providing virtually instantaneous access to a wide variety of information, we will have an even greater ability to get the right product into the customers' hands quickly while avoiding the delays inherent in less automated systems."

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Does it work? Will it last?

MES is succeeding at picking up where MRP II leaves off and providing the real-time control and information that manufacturers are searching for. Industry analysts have predicted continued growth for the marketplace that, according to AMR, experienced a 27 percent sales growth from 1992 to 1993. AMR predicts a 30 percent sales increase in 1994.

In part this growth is attributed to a shift in the approach to integration. While 90 percent of manufacturing execution systems were home-grown solutions in 1988, only 70 percent were in 1991, and a drop to 40 percent is predicted for 1995.

While regulatory reporting continues to take on increasing importance for certain industries, MES with its database core is expected to gain even greater value.

MESA — standardizing the industry

A group of MES vendors joined forces in August 1992 and formed MESA International to help each other and their customers in a way that no technology sharing cooperative ever has. As leading competitors in the MES marketplace, MESA members will seek to standardize the industry, thereby limiting the confusion as awareness increases around this newly emerging technology.

AMR's Fraser agrees that this association will be an asset to more than just the vendors. "By banding together and agreeing on terminology and education," she says, "MESA International should benefit the entire manufacturing market. MESA is certain to be more significant since MES implementations have proven to contribute to users' competitiveness."

For years, vendors of MES have heard their customers or potential customers asking for their technology by function, but not by name. Manufacturers knew what they needed, but not what to call it. But as MES begins to take off and take shape, people are indeed agreeing this is what is needed to get the job done right.

William P. Hakanson is the executive director for the Manufacturing Execution Systems Association.

What do managers do?

- Managers manage well. They have good managerial skills. They know a lot about management.
- Managers decide. They are decision-makers. They must be decisive. They must take/make decisions.
- Managers analyse (US: analyze) information. They are analysts. They must be analytical. They must be good at analysis.
- Managers organise (US: organize). They are good organisers. They have good organisational skills: They are good at organisation.
- Managers compete. They are *fierce*[1] competitors. They are highly competitive. They want to beat the competition.

A senior manager helps decide the general strategy of the company. Senior managers set targets for the company to reach. They decide for example, whether to focus on core business or to diversify. They can do a "SWOT" analysis to assess the Strengths, Weaknesses, Opportunities and Threats in a business situation. A middle manager implements policies decided by senior management. [1]

What is your unique selling position (USP)?

Every company should have a Unique Selling Proposition (USP). What is yours? Some examples:

Starting work

When new employees join the organisation, the employer asks them to sign a contract of employment. The contract states the conditions of employment for each post/position, including details of duties, working hours, holidays and sick pay. Employees are either temporary or permanent, part-time or full-time. Many have flexible working hours. Flexitime and telecommuting is on the increase. The first thing new recruits do is to go through an *induction process*: this can last for anything from a few minutes to several months.

Reducing the workforce

When companies want to downsize, they have to think carefully about how to reduce the number of staff. The least painful way to do this is by natural wastage. Even in companies with low staff turnover, some employees will over a period of time leave, die, resign or retire. In this way the company can reduce the size of the workforce without having to fire (sack) anyone. If this is not enough, older employees are sometimes happy to take early retirement. If there is still a problem there will have to be redundancies (layoffs). Fortunately companies are becoming keener to keep their staff and most people prefer rightsizing to downsizing. [6]

Managing of Processes (M)

Example of processes managers have to deal with:

- An ordering process/ purchasing processes
- A product development process
- A production process
- A staff recruitment process
- A staff training process
- Communications procedures
- Data processing, storage and security
- Finance/Control processes
- Grievance[1] procedures
- Logistics processes
- Marketing processes
- Quality assurance processes
- Sales processes
- Supplier development/integration processes
- Wage negotiations

Firstly, think of a process in your work place and draw a flow chart showing the different steps and stages in the process. Secondly, describe the process, explaining clearly the order of events. Then explain why things are done the way they are.

When describing try to
- differentiate between steps (step = one action process) and a stage[2] (= a series of actions which form part of a process),
- use sequencers [first(ly), second(ly), then, next, after that, having (previously) been, at the same time, simultaneously, lastly, finally]

For explaining purpose, use formal (in order to; in order that) and informal items (to, so that) or others (use to, because). [8]

Managing of logistics

Ron describes the logistic system of Selwood to Peter Schmidt: "Our raw materials, parts and components are delivered by lorries or trains and stored in a warehouse until we need them in the factory. Our warehouse manager is responsible for stock[1] and inventory[2] control. It is his job to make sure key components are always in stock. Sometimes items are temporarily out of stock. He operates a JIT (just-in-time) system and gets consignments from his main suppliers on a daily basis."

Success speaks for itself

Many manufacturers of both discrete and process products have realized the business benefits of MES. Visible results are evident, making the applications stories pleasant ones to tell. The most dramatic improvements have been in the areas of data management and analysis, shop floor control, the availability of real-time information, customer responsiveness and employee empowerment. This results in savings of time, money and aggravation as well as improved employee morale.

For Pfauter Maag Cutting Tools, Loves Park, Ill., quality assurance was a driving force in the implementation of their MES. "The inventory- and MRP-based approach didn't really fit our needs," comments Todd Freeburg, data processing manager. Pfauter Maag produces precision cutting tools for cutting automotive gears. They selected an MES from Effective Management Systems, Milwaukee, Wis.

"We knew we had to have real-time processing," says Brian Klass, materials manager. "Quality assurance is an integral part of the total process for engineering and manufacturing. EMS' system helped us achieve that goal."

CCL Customer Manufacturing-Niles, Niles, Ill., a producer of 14 liquid and aerosol household and personal care items, controlled their process efforts manually before Integrated Technologies, Indianapolis, Ind., installed an MES system. "We had data before. It's just that it was so difficult to gather and analyze. We didn't have time to do much with it," says Joe Schatz, process control manager, referring to the fact that data was gathered and recorded on charts by hand. He adds, "The (integrated technologies) tools have earned their spot at CCL. They help us do a better job. We can now optimize our processes and keep our costs down for our customers."

Komag Inc. was seeking an improvement in control over product quality and increased yield when they implemented a system from Camstar Systems Inc., Campbell, Calif. The company focused on the shop floor of the Milpitas, Calif., plant. After Camstar's system was in place, management was able to apply real-time production monitoring to analyze yield, productivity and machine use. Within the first six months of implementation, output had doubled and the workforce had grown without adding to the system staff. Now they are able to focus on fine-tuning the production process without worrying about control of the shop floor.

In electronics, results are in the numbers

MES' truly shine when it comes to management of the shop floor. Stunning examples of plant-wide improvements have helped manufacturers rise to the top in the marketplace.

Compaq Computer provides remanufacturing and repair services through their Houston Service Operation (HSO). Their highly successful system provided by Industrial Computer Corp., Atlanta, Ga., controls the repair operations for defective units and serves 90 users in the plant. They boast a 72 percent reduction in in-process defects and a 42 percent reduction in WIP. With production nearly doubled, and failure data driving engineering improvements, they attribute these achievements to management's access to an accurate, detailed, real-time perspective of floor operations.

Advanced Micro Devices (AMD) focused on improving operating efficiencies at its semiconductor wafer fabrication site in Austin, Texas, when it installed an MES from Consilium. The company's objectives included removal of paper from its factories. The MES provided innovations in user interface, on-line specifications, statistical process control, process automation and work-in-progress resource tracking and control.

As for the results, the facility was transformed from a predominantly paper-based tracking and control operation to a CIM-based operation, eliminating approximately 90 percent of all paper in the manufacturing area in about 11 months. There was a 40 percent decrease in cycle time and a 35 percent increase in sort yield. Supervisors are able to track status, history and performance, and engineering troubleshooting commonality time has been reduced as much as 300 percent.

Customer responsiveness is a driving force

But what is really at the heart of becoming and remaining successful in the marketplace is keeping the customers happy. That means not only meeting, but exceeding their expectations. Customer responsiveness has become the benchmark of the 1990s.

The Bauer Corp. manufactures fiberglass ladders and rails. Parts for these are produced according to specification at a subsidiary called BC Composites, Medina, Ohio. The software helping them to be more customer responsive is from MDSS, Cleveland, Ohio. Results include more accurate scheduling of orders minimizing set-up time on the equipment, tracking problems early on in a cycle and making certain that work scheduled is consistent with current demand. Says BC President Vic Leonino, "We are encouraged with the early results. The electronic connection between our ordering and planning system and the factory floor (control) allows us to be more responsive to our customers."

Borelli comments, "When the customer asks, 'How is my job coming along? Can we get it early? Can we expedite this process?,' you can't answer, 'I'll get right back to you.' Fourteen phone calls to get the answer isn't good enough any more." With an execution-type system, "the manufacturer can manage his way through the mess."

Current information is the key

The flow and availability of information in real-time makes it possible to be more responsive, to head off problems before they become damaging and costly and to accurately plan based on current information, not assumed or calculated data.

New United Motor Manufacturing Inc. (NUMMI) is the General Motors/Toyota joint venture in Fremont, Calif. It has been "hailed as a model of Japanese production efficiency in the

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CONVERSATION : What management style you find closer to you?
WRITING : Explain how they were motivating (de-motivating) your team during the summer practice.

is Ideal for you