PRESENTATION

One of the challenges the ILO and its members in the region have to face is to develop productive practices that foster decent working conditions. These practices have to be participative, they must involve training and be beneficial and safe, and they must promote gender equity and an environment of social dialogue. This is only possible if they lead to increased labour force productivity and improved competitiveness in highly competitive markets.

In the sixth key point of the Global Employment Agenda, "Employability by improving knowledge and skills", it is stated that education and skills are vital sources for improved employability and greater labour productivity. The Agenda goes on to assert that "a strong skill base promotes productivity and employment in at least two ways. First, it enables enterprises to adapt rapidly to change, innovate and move with greater ease up the value chain. Second, skills and an education system that enables people to learn underlie the individual's employability. This, in turn, allows for new knowledge to be more rapidly applied within the enterprise. It also gives people greater labour market security when their present jobs are at risk."

Vocational training institutions in the region are interested in the impact training has on productivity. Many of them are implementing programmes aimed at improving the productive equation not just by competency-based training of the workers but also through a variety of activities like HRM consultancy services for enterprises, support for technological development, environmental protection, heath and safety management, quality management and other aspects of enterprise administration. This is a good way to promote decent work because, along with productivity and competitiveness, it could make it a key objective in national development strategies.

Various institutions in the region have already implemented specific experiences to provide themselves with an evaluation system to gauge the impact that worker training has on productivity. Examples of this are the INFOTEP in the Dominican Republic and the INTECAP in Guatemala. Similarly, in Mexico, Cuba and Chile enterprises have made efforts to improve productivity by developing training in the workplace.

This is a guide to the System for Measurement and Improvement of Productivity (SYMAPRO). In this system, the social actors in an enterprise agree on objectives, and indicators for these are systematically measured. Then, in a process of dialogue and analysis, the social actors are invited to commit themselves to raising productivity and improving working conditions. The SYMAPRO is an organizational learning tool based on non-formal education, and it involves a combination of practical and technical knowledge.

It is an integrated and holistic system because it involves proposing and analysing improvements not only in productive processes but also in working conditions, which includes health and safety management at work and attitudes in areas like tidiness, cleanliness and absenteeism. The indicators for all these varied aspects are based on just one criterion: effectiveness.

SYMAPRO is the path towards changing the culture of work. It is geared to creating a work atmosphere of cooperation and confidence built on efficient and continuous communication between senior managers, middle level staffs and operational personnel, and aimed at reaching objectives in different areas.

This is in harmony with the ILO policy to promote decent work in the region and at the same time to facilitate the application of many of the measures enshrined in ILO Recommendation 195 concerning human resources development. In fact, the SYMAPRO is a mechanism to enhance social dialogue about knowledge, with the focus on raising productivity and improving working conditions. The ILO promotes it as a method to improve communication within organizations by establishing commitments on both sides to pursue objectives that the social actors and productive organizations share.

SIMAPRO is following the resolutions of the Global Jobs Pact as it is meeting the challenge of providing responses to the world crisis with policies and practices to promote decent work. The system fosters improvements to productivity and working conditions, and it includes environmental protection, respect for workers' rights, the promotion of gender equality, participation by the people and social dialogue. It helps to optimise the use of material, financial and human resources in a scheme of organization through people.

Over the last 15 years, in a joint action initiative by the ILO Office in Mexico and ILO/Cinterfor, the SYMAPRO has been implemented in enterprises in Mexico (especially in the sugar industry), the Dominican Republic, Cuba, and more recently in Guatemala and Chile. The SYMAPRO methodology was adapted to the specific circumstances in each of these countries so implantation was solid in each case. Information about these experiences, and analysis and support, is available at the ILO web site: www.oit.org.mx/simapro. There is also software about the application of the model that is available on an Internet platform. This Guide is an additional resource to support application of this methodology and to extend the system to other enterprises and countries. No doubt the Guide will facilitate the training of supervisors, managers and union members who are interested in utilising the SYMAPRO, and also that of technical staff in the training institutions involved in providing support for productivity in enterprises.

INTRODUCTION

This Guide is an instrument for raising labour productivity and improving working conditions through informal and formal training processes, collective as well as individual, in organizations. The instrument this Guide explicates is called the System for Measurement and Improvement of Productivity (SYMAPRO). The key characteristic of this system is that the measurements utilised are derived from group learning, and that group learning is checked against the measurements to verify that the action taken is having the anticipated impact not only in productive processes but also in social processes.

Instruments like the SYMAPRO are important in situations in which organizations are obliged to invest in training in order to remain competitive in markets and/or to improve their capacity to assimilate new technologies and new systems for quality, production and work organization.

At the same time, these organizations have to respond to the social need to improve working conditions. In other words, training should not only lead to greater productivity but it should also promote decent working conditions so the dynamic of the improvement can be sustainable over time.

The main virtue of the SYMAPRO is that it fosters this twofold impact, on productivity and on working conditions, through a system of ongoing group learning. It is not easy for organizations to install a system of this kind and maintain it over time. This is not because the methodology is hard to assimilate, on the contrary, it is relatively straightforward, but because it can be difficult to overcome a predominant work culture in which the spaces for knowledge-based dialogue between senior management, middle management and workers are very restricted.

This Guide is based on the experience acquired when a pre-established model was adapted to real conditions in organizations in Latin America, particularly in Mexico and some Caribbean countries (Cuba, the Dominican Republic). It contains examples, good practices and reflections derived from ten years of experimentation and progress in the methodological development and management of the SYMAPRO. But in the final analysis it is just a guide, which means that each organization will have to adapt the content to its own specific needs and conditions.

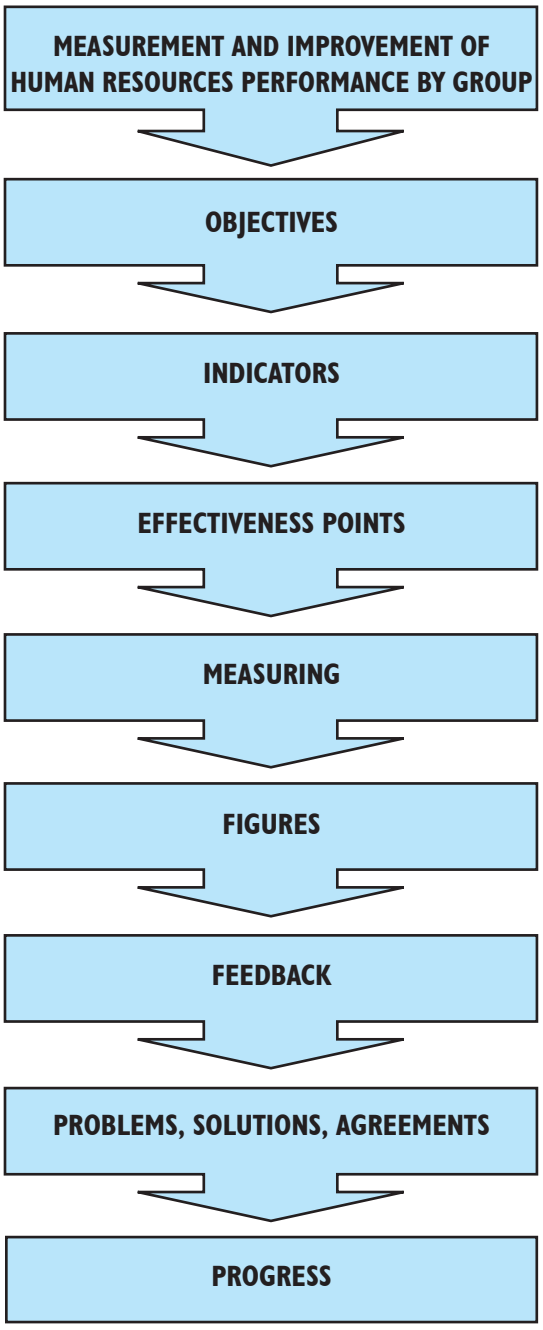
The Guide is made up of four parts. The first describes the concepts behind the SYMAPRO and their connections to ILO objectives and policies. The second is the measurement component, which explains step by step how to construct a system of indicators. In the third part we come to the heart of the model, the feedback component, which involves the training element. In the fourth part we make some recommendations about the best ways to manage the system.

SYSTEM FOR MEASUREMENT AND IMPROVEMENT OF PRODUCTIVITY

SYMAPRO

What is the SYMAPRO?

The SYMAPRO is a permanent, holistic and inclusive learning system in organizations that is geared to achieving the organization's objectives as a whole, these objectives being agreed by all the people involved. The aim is to improve efficiency, quality and working conditions in the organization by involving operational personnel, middle management and senior management, and getting them all to make a commitment.



The SYMAPRO is based on systematic measurements using groups of indicators that capture the organization's objectives. These indicators are agreed beforehand by the social actors. The measurement results from each work group or area are analysed, and this is used as the basis for making continual improvements. The success and impact of each improvement proposal is monitored through ongoing group feedback. This in turn is used as the basis for implementing productivity incentives in recognition of people's performance.

In this way the SYMAPRO converts human resources or personnel management into a strategic function in the organization. It becomes a tool to mobilise people's abilities to contribute to objectives and goals that have been previously agreed. The system gives management feedback about dysfunctional situations in different departments, and about solutions which emerge from workers initiatives.

The SYMAPRO is an approach that allows various ILO policies to be built into organizations in a convergent way.

It is an instrument oriented to decent work in organizations, and it involves getting all the personnel in an organization involved in processes to improve productivity and working conditions.

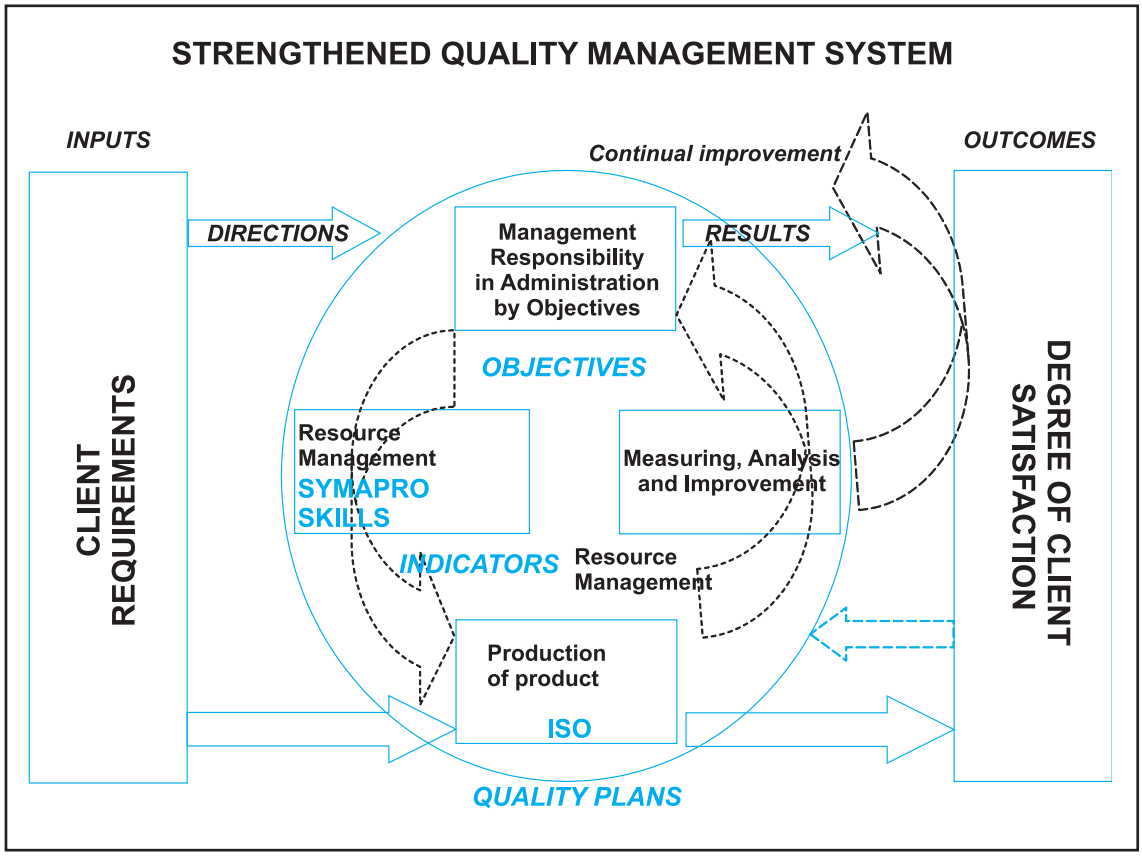
As an instrument it involves the practical implementation of ILO Recommendation 195 concerning human resources development, which promotes the need to create permanent learning mechanisms in organizations. The SYMAPRO is also a mechanism for knowledge-based social dialogue, and the ILO is promoting it as a vehicle to improve communication inside organizations by establishing commitments geared to objectives that are shared by the social actors.

What are the benefits of the SYMAPRO?

The SYMAPRO helps to change the work culture in an organization by fostering an atmosphere of collaboration and confidence based on effective and constant communication between senior management, middle management and operational staff, oriented to achieving objectives at department or area level. It helps to establish uniform operational criteria among all personnel and brings everyone into line with the organization's mission, vision and values. It facilitates people's involvement in projects to promote quality and technical and organizational changes. It generates action to promote continuous improvement, based on commitment and follow-up by employees as well as managers.

These benefits of the SYMAPRO become significant when they are coordinated with a management project in the organization. The SYMAPRO is a tool that helps to transform management programmes, especially ISO quality management and/or management by objectives, into an organization and work culture. It utilises projects and systems derived from the organization's strategy to forge links between operational staff and middle management. This linkage makes it possible to involve all staff in the interactive construction of management systems. The SYMAPRO amounts to a system of social innovation at work whereby the employees' creative abilities are mobilised and the ambiguities inherent in the organization can be managed.

At the operational level, the SYMAPRO contributes to the administration of the organization's performance. It makes it possible check annual programming against the real results, identify problems that emerge, and systematically generate proposals for improvements, and thus it becomes a management system for planning and budgets. The feedback meetings are programmed and include training capsules that are drawn up in function of the skills that need to be developed and delivered at the meetings. This also constitutes a quality system, and, thanks to the SYMAPRO indicators, it can be evaluated in terms of impact.



What are its characteristics?

The SYMAPRO is an instrument for organizational learning based on informal training in which theoretical knowledge is combined with practical knowledge, and technical knowledge with social knowledge. Good practices that are the product of experience are combined with theoretical concepts.

It is **integrated and holistic** because it involves analysis and generates improvement proposals not just in productive processes but also in working conditions, in the management of health and safety at work, and in attitudes towards cleaning for example, orderliness and absenteeism. The respective indicators in each case are standardised in line with one overriding criterion, which is effectiveness. It is holistic because it is based on an analysis of the work process taken as a whole, with social aims as well as process efficiency and quality objectives. It means that an organization's productivity can be linked to a systematic review of the labour skills of its personnel, and these people actively participate in the process of identifying and overcoming obstacles in the productive processes.

It is **flexible** because it can be adapted to any organization that has objectives, and it can be easily modified to cater to new aims or goals. This makes it an instrument

that, from the human perspective, facilitates constant changes in organizations by making the staff part of the process that generates change.

It is **permanent** because involvement and continuous improvement never come to an end but are organized in cycles, which means that processes can be evaluated and innovations introduced when necessary.

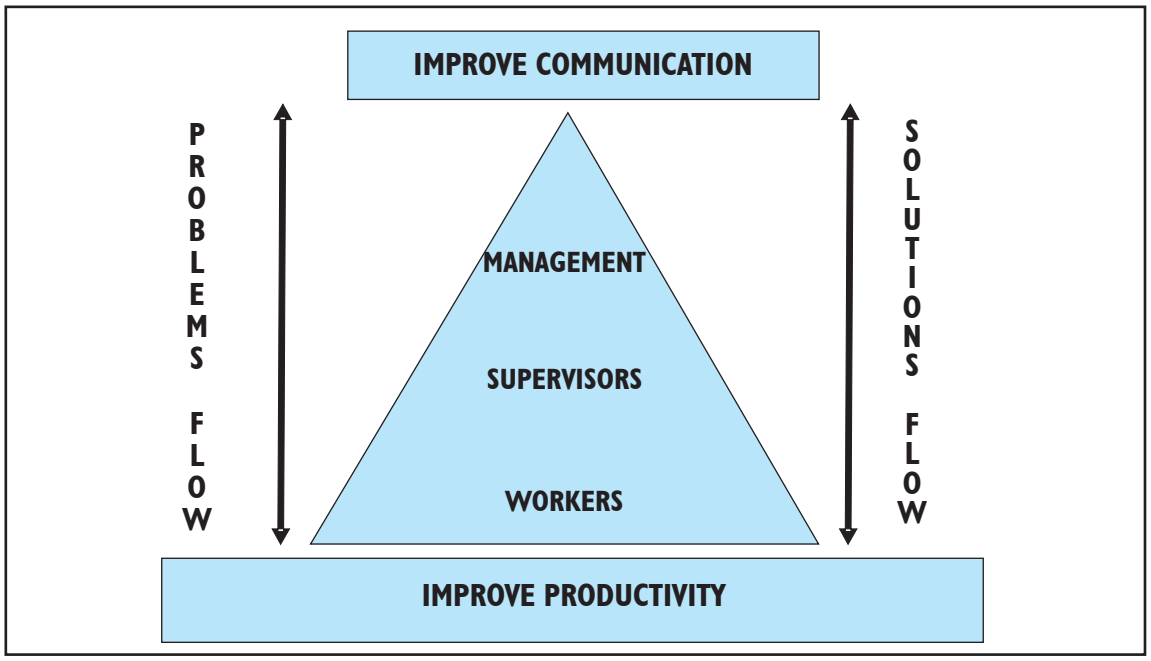
It is **inclusive** because all staff participate, from those at the bottom of the hierarchy right up to the general manager, and because people's contributions to improvement are recognised. It is based on the conviction that details are an essential part of any system to improve productivity, and on improvements that are made to the work processes of each and every person in the organization. Performance evaluation criteria are defined and shared, and they form the basis for recognition which is conferred through various kinds of incentives.

What are the advantages of the SYMAPRO proposal?

The SYMAPRO measurement system has various advantages or virtues.

First, it makes it possible to **integrate** into a single system objectives that at a given time may conflict with each other. For example, the objective of quantity per hour may conflict with the objective of product quality. Both objectives are important for the enterprise but there may be a point at which greater quantity has a negative impact on quality, or vice versa, where better quality reduces quantity.

Second, the system makes it possible to **add together** indicators of different kinds to yield one single rating for productivity, expressed as effectiveness. Managing several different indictors makes for complexity, but in this system diversity can be reduced to a single figure, which makes for easy communication within the



organization. The fact that there is just one number makes it easy to understand if a given operation is going well or badly, so it helps to motivate staff and thus contributes to a learning environment.

Third, the system develops in a **"bottom up"** way. It starts from the "ground floor", so to speak, of the organization, in other words from the operational personnel. These are the people who best understand the critical factors in day to day operations and know what the most suitable indicators to measure those factors are. To the extent that the people at the bottom level help develop the system they will appropriate it as their own, which means they will enter into a genuine critical dialogue with management about what path to take. This process improves communication between the different levels of the organization.

Fourth, through the feedback meetings, the measurement system enables people to connect in a "natural" way with training events. Problems that come to light during the process should be regarded as obligatory points of reference to be used to develop training programmes based on principles of alternation between theory and practice and that make a direct contribution to improving productivity and working conditions. The system helps to generate an atmosphere of motivation and stimulus with regard to learning, thus paving the way for skilled work enhancement in the organization.

What kind of organization can it be applied to?

The SYMAPRO functions for any kind of organization and at all levels. It has been implanted in large organizations and also in micro and small ones, and it has been implemented in the production area, in administration and in management. As long as there is a will to establish objectives and follow them up systematically, the SYMAPRO can be implanted and serve as a measurement and improvement instrument.

Where did SYMAPRO start and who is applying it?

The SYMAPRO was originally developed in the 1980s by professor Pritchard of the University of Texas. It was called "ProMes". In the 1990s it spread to other industrialised countries and by 2004 it was being applied in more than eleven of them. It arrived in Mexico in 1995 via a convention between the University of Tilburg in Holland and the ILO Office in Mexico. The system was adapted and implanted on a trial basis in an enterprise in the sugar sector. It was well accepted and subsequently implemented in other enterprises in the same sector, and by 2005 it was in use in 16 such enterprises. It also spread to the Dominican Republic, where the INFOTEP included it in its programme of consultancy services for enterprises. It is in use in sugar sector enterprises in Cuba and Central America

(Guatemala). In Mexico, apart from the sugar sector, it has been applied in advisory services for SMEs, maquiladora export enterprises and service branches (tourism). In Chile, the fresh fruit sector started to use SYMAPRO in 2007 as a integrated training tool for temporally workers in the preparation, cultivation, harvest and packing processes; it is supported by the sectoral training body and social programmes of the government.

How to follow the SYMAPRO Guide?

This Guide is made up of three components that we consider essential for implanting the SYMAPRO in an organization. The first component is the measuring system. In the SYMAPRO, productivity is defined and measured as effectiveness. It is the efficient attainment of objectives set by the members of the organization for a defined period. When there are a number of different objectives at the same time, measuring with a single indicator is particularly complex, but the SYMAPRO makes it simple. The performance goal in a department is set by the members of the group themselves, and performance by this criterion is followed up using measurements from suitable indicators that are constructed jointly by operational staff and middle and senior management. These measurements also make it possible to evaluate the impacts of improvements that are proposed and implemented, and these in turn are based on individual and collective learning and on the management of skills.

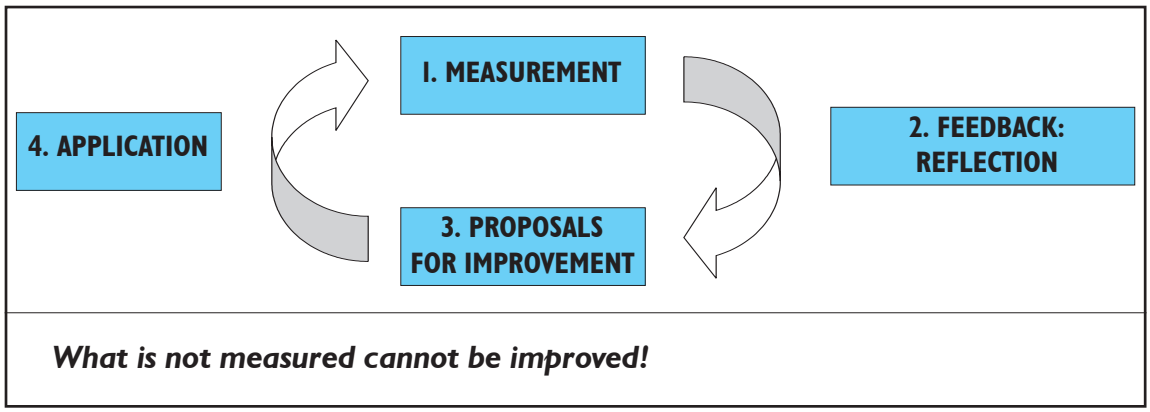
The second component is the very heart of the SYMAPRO: it is feedback. Measuring is necessary but not sufficient to bring about improvement. There also has to be reflection based on the results of the measurements, and this generates improvement proposals that are then applied in practice. This requires the ability to infer the content of informal and formal learning grounded in an analysis of the measurements the indicators produce. This calls for a new kind of leadership on the part of middle and senior management, as they have to manage the innovation and coaching that leads to change. Measuring is systematic, and this is what differentiates the SYMAPRO from other techniques to manage improvement, it is always geared to initiatives aimed at objectives.

The third component is the management of the SYMAPRO itself. Guided by experience, the outstanding aspects that successful implementation of the SYMAPRO depend on have been systematised. Various implementation stages have been defined: these include planning the start, consolidation and expansion, maturity, and renewal. Each of these stages has its critical points, and all require competent leadership to make changes in how the system is managed. Different actors in the organization have to change their leadership roles in function of the evolution of the succeeding stages of the SYMAPRO, and this is not easy as the degree to which different people are involved and committed depends on the organization's culture and on personal interests, and these are asymmetrical.

MEASUREMENT SYSTEM COMPONENT

What is the SYMAPRO measurement component?

The SYMAPRO is made up of four parts. The first is measurement, the second and third are feedback and improvement, and the fourth is implementation. The four parts are interconnected. Based on measurements, the organization's staff become conscious of the point where the organization's productivity is located. This enables them to set priorities for making improvements. The steps taken to bring about improvement are evaluated again, in the light of fresh measurements, so what is set up is a "virtuous" process of continual improvement.



What is measured?

In the SYMAPRO, what is measured is **the efficient attainment of work group objectives.** Productivity is defined as *effectiveness*, which is the simultaneous and efficient attainment of objectives in the organization. This definition has a number of implications. The main one is that the scope of improvement in productivity depends on the commitment and learning capabilities of the members of the organization. The starting point is setting objectives, and there are learning efforts throughout the measurement cycle.

Organizations usually have some general objectives that apply to all departments or areas and other specific objectives that apply only to a particular department or process. In the SYMAPRO the specific objectives are derived from the general ones, and this ensures that the two sets are congruent. The staff contribute directly to the specific objectives through their performance, and they contribute to the general objectives indirectly, through the specific objectives and in combination with the performance of other department. For example, general objectives include the enterprise's mission, vision, values, code of conduct or of ethics, enterprise social responsibility and sustainable development. These can be translated into objectives for individual areas, departments or processes. Thus the system ensures that efforts made by a work group in pursuit of its own specific objectives also contribute to the organization's general objectives.

Attaining specific objectives depends on the performance of the work group, but not necessarily on them alone. Other factors can also have an influence, such as in a productive process whose raw material is not of uniform quality, or if highly complex technology is involved, or when markets fluctuate wildly. With the SYMAPRO, the organization has a tool that, through measurement, gives not only direction but also motivation to group effort in a way that is congruent, relevant and consistent with global or general objectives.

Example:

One general objective of an enterprise 'X' is to satisfy its clients' needs. At the level of the production department this translates into meeting quality specifications, responding rapidly to changes in demand and being highly efficient per work hour so as be able to offer the product at a low price. On this last point, the specific objective is to reduce idle time through bad operations and to maintain the rate of production per effective work hour.

The enterprise has another general objective, which is to generate a safe and healthy work environment. At the level of production this translates into acting in a safe way and maintaining healthy conditions with regard to cleanliness and hygiene and in sanitation services.

How does measurement work?

Objectives are measured by the use of indicators. These *indicate* the extent to which we are approaching or moving away from the objective we have set. Each indicator has an immediate objective. This may be the same as a general objective or it may be specific to a particular area but derived from a general objective. For example, reducing work accidents is a general objective and also an immediate objective for the production area. Reducing costs is a general objective, and at the level of the production area perhaps it translates into the immediate objective of reducing idle time.

In the measuring process, observable units and standards are utilised, that is to say criteria that do not change. For example, the *number* of accidents or the *minutes* of time lost per shift.

An indicator is a time series that is useful for interpreting how a process behaves with respect to an established goal.

Source: Heredia (2004).

SYMAPRO ENTERPRISE 'X'	
GENERAL OBJECTIVE:	**REDUCE COSTS**
SPECIFIC OBJECTIVE:	**REDUCE IDLE TIME IN MILLING**
INDICATOR:	**IDLE TIME LOST THROUGH BAD OPERATIONS**
MEASUREMENT UNIT:	**MINUTES**

Some specific objectives contribute to more than one general objective. For example, the specific objective of cleanliness and order contributes to the general objective of accident prevention but it also contributes to cost reduction and to improving the quality of the product and the process.

The problem with this specific objective is how to measure it in reliable way. One indicator that is frequently used is to draw up a checklist reflecting cleanliness and order that can be observed unequivocally. For example, the absence of tools, steel wool or pieces of metal on the floor. In the foodstuffs industry this objective is connected to standards of good habits and practises in foodstuff manufacturing: good manufacturing practice (GMP). The points on the list are directly connected to reducing the risk that the food product may cause harm, and they include habits such as not smoking or chewing gum in production areas and not eating while at work.

The order and cleanliness or GMP indicator captures compliance with the points stipulated, and the units of measurement are the points on the observation list. What is difficult here is to maintain objectivity in measuring progress in work practices that are usually rather undisciplined in these areas.

General objectives can be derived from the enterprise's mission, vision, values and code of conduct, and can then be translated into specific objectives for the various areas or departments.

EXAMPLES OF MEASUREMENT OF CLEANLINESS AND ORDER IN THE FOODSTUFFS INDUSTRY
Points to comply with
No smoking in work areas
No chewing gum in work areas
No eating in work areas (peanuts, seeds)
No spitting near work areas
No wearing rings or watches in work areas (process)
Keep lockers clean
No glass objects in work areas
No aluminium objects in work areas
No rubbish on floors or equipment (steel wool, papers, etc.)
No metal waste (nuts, screws, tubes, etc.)
Clean bathrooms (toilet bowl, washbasin, toilet paper, dry floor)
Totals

How are values given to the measurement results?

The results of the indicator measurements will show whether our performance is good, regular or bad. In the SYMAPRO methodology, each measurement is rated in function of the objectives to be reached. The process of determining what it is viable for the organization to achieve depends on its context, that is to say on its technical and human resources and on the circumstances of the market. This rating in function of objectives to be attained is called **effectiveness.**

The results of the measurements on an indicator may be very effective in one organization but not very effective in another. For example, saving ten minutes of time lost per shift in a process industry may be very effective for an enterprise with backward technology but not very effective in an enterprise that has a high degree of automation and instrumentation.

In the SYMAPRO the results of each indicator are converted into *effectiveness points*. These show how good a particular result was with regard to the objective that was set. There is a scale with three key marks that we call **"anchor points":**

a) **+100 points**: the best the indicator can show in the context of the organization.

b) **0 points**: not good or bad in terms of what the indicator can show.

c) **-100 points**: the worst the indicator can show.

We call these the "measurement intervals". A criterion for setting these anchor points has to be chosen. For the point '0' we can utilise the plan and budget as reference points. The extreme points, the best and worst, should reflect real situations in the organization that have occurred at some time or other.

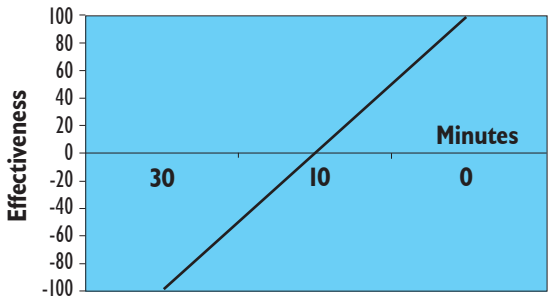
The form utilised to determine the intervals (in line with the example) is as follows:

General Objective: *To Reduce Costs*			
Specific Objective: *Production Area: Reduce Idle Time*			
Indicator: *Idle Time per Shift*			
Measurement Unit: *Minutes*			
Effectiveness:	+100	0	-100
Indicator Value	**0**	**10**	**30**

To facilitate conversion of the results from the indicators, the relation between the indicator and effectiveness can be expressed on a graph using the three key points. We call this the conversion graph of the values of the indicator to effectiveness points.

With this scale, effectiveness points are allocated to the indicator results. In the example of idle time, it is determined that ten minutes of time lost per shift is "neither good nor bad", 0 minutes is "very good" and 30 minutes is "very bad", so with this indicator we can calculate effectiveness per shift per day.

Conversion Graph of Indicator Values for Idle Time at Effectiveness Points



If the first shift had five minutes of idle time on Monday it earns 50 effectiveness points, if on Tuesday it had one minute of time lost it receives 90 points, and if on Wednesday it had 20 minutes of time lost it receives -50 (minus 50) points.

The indicator value can be converted to approximate effectiveness points using a table of equivalences. Values are put at intervals (for example 0, 2, 4, 6, 8…minutes of idle time) and each is given the corresponding points to make the conversion in equal proportions (for example 100, 80, 60, 20…effectiveness points). When the value obtained from a measurement falls within a certain interval it is rounded up or down as the case may be. In our example, 59 seconds of time lost is rounded down to 0 minutes, 61 seconds is rounded up to 2 minutes, etc. The shorter the intervals the more precise the conversion.

There is a more exact way to make the conversion, which is to employ a mathematical formula. To do this we must first determine if the indicator measurement value falls in the positive or negative segment of the effectiveness points scale.

When it falls in the positive segment, formula (a) in the box is applied and the 100 positive multiplier is used. When it falls in the negative segment formula (b) is applied and it takes the 100 negative multiplier.

In our example, five minutes of idle time falls in the positive segment of the conversion graph. We apply formula (a) from the box. We do the exercise step by step. **Step 1**: determine the values of the variables in the formula: V(max) = 0; V(1) = 5; V(0) = 10. **Step 2**: carry out the partial operations: V(1) – V(0) = -5; V(max) – V(0) = -10. **Step 3**: carry out the final operation: E(1) = {(-5)/(-10)}x100 = 50. Therefore five minutes of time lost amounts to 50 effectiveness points.

In the same way we can work through the example of a measurement that yields twenty minutes of idle time. We use formula (b), which corresponds to the negative segment of the graph. **Step 1**: determine the values of the variables in the formula: V(min) = 30; V(1) = 20; V(0) = 10. **Step 2**: carry out the partial operations: V(1) – V(0) = 10; V(min) – V(0) = 20. **Step 3**: carry out the final operation: E(1) = {(10)/(20)}x-100 = -50. Therefore the twenty minutes of idle time amount to -50 (minus 50) effectiveness points.

FORMULA TO CONVERT INDICATOR VALUE TO EFFECTIVENESS POINTS

a) when the observed indicator value is **greater than or equal** *to* what corresponds to zero effectiveness points:

$$E(I) = [(V(I) - V(0)) / (V(MAX) - V(0)] \times 100$$

b) when the observed indicator value is **less** than what corresponds to zero effectiveness points:

$$E(I) = [(V(I) - V(0) / (V(MIN) - V(0)] \times -100$$

Where:

E (1): effectiveness of the indicator corresponding to the measurement number 1

V (max): value of the indicator that corresponds to maximum effectiveness (100 points)

V (0): value of the indicator that corresponds to zero effectiveness

V (min): value of the indicator that corresponds to minimum effectiveness (-100 points)

V (1): value of the indicator at the measurement number 1

By applying the approximate table of equivalences method or the precise formula method outlined above we can convert the observed values of the indicator into effectiveness points that express how closely we are approaching or how far we are moving away from the objectives that have been defined.

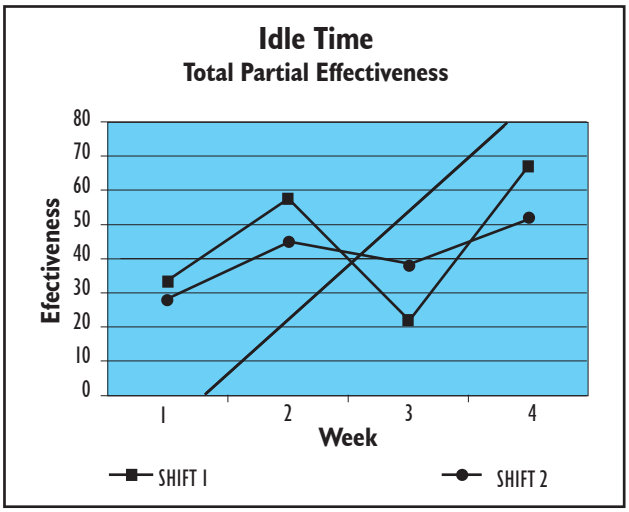
Week 1
Indicator: Idle Time, Unit: Minutes

	Shift 1	Shift 1	Shift 2	Shift 2
	Value	Effectiveness	Value	Effectiveness
Monday	5	50	0	100
Tuesday	1	90	5	50
Wednesday	20	-50	25	-75
Thursday	10	0	6	40
Friday	5	50	5	50
TOTAL		140		165
Average		48		33

At the end of the week we can make a break in the measurement. The effectiveness points for each day are added up, and this gives the effectiveness for the week, which tells us whether the performance of that department or area has been good, regular or bad in this period. This information can be compared with other shifts in the same department.

In our example, shift 1 had a total of 140 effectiveness points in week 1 and shift 2 had 165 points; the daily averages were 28 and 33 respectively. These calculations can be made week by week, so we can represent progress over time visually with a graph or table called *total partial effectiveness*. It is partial because at this time we are taking measurements from just one indicator that corresponds to just one objective or part of an objective.

This system also enables us to make a total of results per shift for all the weeks and thus obtain an accumulated total for an entire period (three months, for example). When this figure is compared to the maximum possible (the number of weeks multiplied by the number of indicators and by 100) we can see the extent to which we have attained or fallen short of our objective in the period.



For example, in our case with a single indicator (time lost), after four weeks shift 1 had a total of 163 effectiveness points, the figure obtained by adding up the *averages* for each week. Shift 2 had a total of 180 points. The maximum possible for these 4 weeks was 400 points. The degree of achievement in function of the maximum possible was 41% in shift 1 and 45% in shift 2.

IDLE TIME
EFFECTIVENESS POINTS

Week	Shift 1 (average)	Shift 2 (average)
1	28	33
2	45	58
3	38	22
4	52	67
5		
6		
Real total (a)	163	180
Maximum possible total 4 weeks (b)	400	400
% achievement (a)/(b)	41%	45%

The results can also be interpreted in terms of the zero effectiveness point, the point that indicates neither good nor bad performance. If the criterion to determine this point was the plan or the budget for the half year or year, the results acquire a different significance: in four weeks shift 1 managed to exceed the plan by 41% and shift 2 by 45%.

It is important to remember that in order to make this calculation the reference unit of time for calculating the averages has to be determined. In this case, the week was taken as the reference time unit. The average for

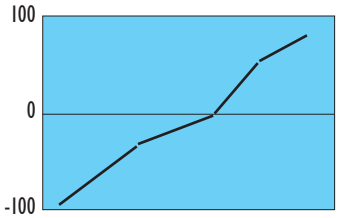
It would be a mistake to interpret the simple aggregation of the weekly averages of effectiveness points as the percentage of achievement or non-achievement of the plan or budget. However, the average of the weekly averages can be used for this purpose.

the weeks indicates the extent to which a result is above or below the plan or budget for the objective in question.

The way to interpret the effectiveness and the sense of the data is important in the model. The basis of the SYMAPRO is to raise the organization's productivity by effecting a *change* in people's behaviour that stems from a change in motivation. This change in staff behaviour is oriented to improving their strategies for performing their tasks or functions, and reducing their and other people's wastage of time and effort. Motivation is considered the key factor behind making personnel seek new strategies and new ways to better achieve their objective or carry out their task.

Depending on the organization's culture and its situation in time with respect to its strategies and the dynamic of the market, the results are expressed as the achievement of exceeding the zero point. This may be the planned target, or it may be how the shortfall can be made up to attain the maximum possible, which is the target that corresponds to 100 effectiveness points.

The conversion model to change indicator values into effectiveness points does not necessarily have to have a linear form from -100 to +100 points, it may also be constructed with a different scale.



Non-linear example

One option is NOT to make the relation linear. This would be justified when there is no constant proportional connection between effort made and results in the value of the indicator. For example, at the zero effectiveness point (the plan) a little effort can bring about a considerable improvement in the indicator value for time lost, but the closer we move to the maximum possible value the greater the effort needed to bring about an improvement in the indicator. In this case, the message we want to send the staff is that they should evaluate the situation when the indicator is near the peak and decide whether it is worthwhile continuing to make a great effort to improve the value even more, or if they should dedicate their energies to improving another indicator. This might apply to situations in which quality objectives have to be combined with efficiency and flexibility objectives.

Another possibility is not to assign the same weight to all the indicators. In the case of the cleanliness and order indicator, for example, it could be argued that the maximum effectiveness should be +10 points and the minimum -100. This would mean that this item is valued negatively if its indicator values fall short, but when the objective is attained the positive effectiveness is small, only 10 points. This would be justified when we wish to link positive effectiveness points with monetary incentives for the staff, and when the indicator, in this case cleanliness, is a conditioning but not a definitive factor in generating income (sales).

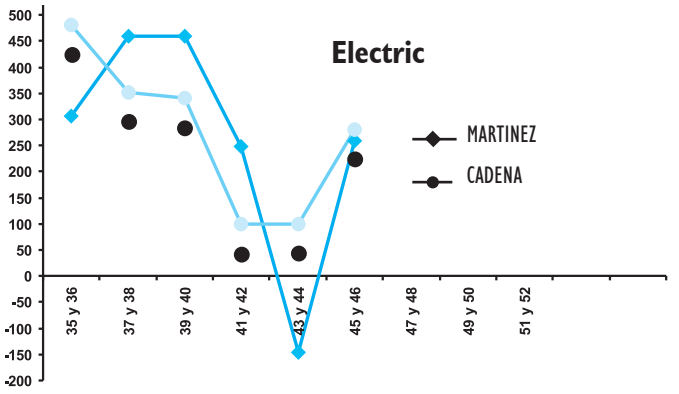
Why are measurements converted into effectiveness points?

There are two reasons for converting indicator measurements into their equivalent effectiveness points. First, because it helps us to know and give a value to how near or far we are from the goal set for the objective in question. A result of 90 points indicates we are very close to the maximum possible for that objective, whereas a result of -50 points means we have fallen far short of the maximum level and therefore the objective.

The second reason, which might be more convincing than the first, is that this system makes it possible to add up various indicators, and therefore objectives, because they are all standardised under the indicator of effectiveness. This enables us to aggregate a number of different objectives, for example combining a quality indicator with one for efficiency, or one for safety with one for behaviour like absenteeism. We can add up the total of "apples" and "pears" and then add both to "cheeses", so to speak, and the basis for this is how near or far each item is from its set objectives.

EXAMPLE

TOTAL EFFECTIVENESS IN THE CORRECTION PERIOD



WEEKS	MARTINEZ	CADENA
31 y 32	306,00	480,00
33 y 34	460,00	351,00
35 y 36	460,00	340,00
37 y 38	249,00	99,00
39 y 40	-146,00	100,00
41 y 42	260,00	280,00
43 y 44		
45 y 46		
47 y 48		
49 y 50		
51 y 52		
GENERAL AVERAGE	264,83	275,00

This is also important for two reasons. First, due to the fact that what we have here is a motivation instrument people tend to focus their energies on carrying out tasks and functions that are measured, and pay less attention to those that are not measured. If only one indicator is measured there is a risk that other factors that are important for the organization's objectives might not be considered, and this is connected to the second reason.

The second reason is that today organizations are faced with a complex market situation that demands not just cost or quality but also the ability to respond flexibly and quickly, to develop new designs, to comply with government regulations and to provide working conditions that are decent and suitable for continuous learning.

It is not easy to gear an enterprise to all these objectives at the same time. A measurement system that makes it possible to integrate all these objectives and their respective indicators on one single base helps enormously in the management of the organization as it provides a quick picture of how good or bad the day, week or month has been. With this information more congruent corrective action can be taken and a balance between different objectives can be found. In addition, the performance of one shift or team can be compared to that of another, and this can be linked to a results-based incentive system.

For example, in a sugar refinery there are three shifts in the milling area. The organization has efficiency and process quality indicators, such as effective milling per hour and the percentage of sugar that is not extracted from the refinery but remains in the bagasse ("wastage in bagasse"). These two indicators have to be kept in balance. If milling per hour increases too much this will have an adverse effect on the quality of the product and sugar will be lost in the bagasse. That is to say, what is gained on one side is lost on the other. Apart from this there are also indicators of a social kind, such as wearing personal protection equipment, maintaining cleanliness and order, and the question of absenteeism. To sum up, if there are five indicators they can yield a maximum of 500 effectiveness points (5 times 100) per shift per day, and a minimum of –500 effectiveness points (5 times -100 points). The sum of points is called "total effectiveness".

With the daily measurements per shift we obtain measurements of total effectiveness that show how good the day was in function of the set objectives. We can also make comparisons between groups. In the case of the sugar refinery in the example above, we can compare the results of the three shifts. At the end of a given period, harvest or processing operation, we have the total results of each shift or work team, which in turn serves as the basis for a system of incentives or payments.

In the example of enterprise 'X' we measured idle time so as to try to reduce costs, but we can also add other indicators and objectives that are important for the organization. One could be the aim of improving the quality of the product. In the production area the indicator for this objective is rejects per shift, measured by the number or percentage of pieces per shift that do not meet the specifications. This indicator helps towards another objective, which is cost reduction, and also leads to greater client satisfaction with product quality because it lessens the probability of a bad quality item being delivered.

In addition, a "social" objective can be set, such as to have a safe and healthy work environment. An indicator for this is the degree to which personal safety equipment is worn. The question is how to measure this indicator, and one measurement unit that could be used is the percentage of people per shift who wear the safety equipment. The problem is that the quantitative result obtained has to be converted into a percentage. Another way to measure this is to use a "negative" measurement criterion, the number of people in the work area who do not wear the safety equipment provided. This unit of measurement has two

advantages, namely (a) that it is easy to observe and calculate, (b) even when personnel in the work area vary, for example eventual or contracted workers, the measurement still gives a clear and unequivocal result, geared to the objective in question.

Another objective of the "social" kind is to maintain the premises in a clean and orderly condition. This contributes to other objectives like improving costs, quality and the work environment. The cleanliness and order indicator can be measured with an observation list of points with clear criteria for each. If the list has 8 points, the units of measurement will be these points.

Another social objective is to reduce absenteeism. This directly affects the other objectives mentioned here, especially when absenteeism is frequent and a significant number of people are involved. High absenteeism increases the risk that there will be greater time loss, production rejects and accidents, either because the workload for the workers who do the job is greater, or because replacement personnel are not sufficiently skilled and/or trained.

With all these objectives integrated into the system, the SYMAPRO matrix of indicators and effectiveness points in enterprise 'X' in our example would be as follows:

ENTERPRISE 'X' MATRIX OF INDICATORS AND EFFECTIVENESS				
Effectiveness Points		-100	0	+100
Production Area				
INDICATOR	UNIT OF MEASUREMENT			
Idle Time	Minutes per shift	30	10	0
Rejects	% defective per shift	15	10	5
Wear safety equipment	Number people without equip/shift	3	1	0
Cleanliness and order	Observation list/ shift	4	6	6
Absenteeism	People absent per shift	2	1	0

ENTERPRISE 'X' TOTAL EFFECTIVENESS Production Department		
Week	Shift 1	Shift 2
1	157	247
2		
..		
..		
Total	157	247

Let us look at an example with these indicators. The results of the measurements obtained in week 1 are converted into effectiveness points using the matrix of indicators and effectiveness with the three anchor values of the model (-100, 0 and 100). First, the effectiveness points are calculated per indicator per shift per day. Then the partial calculations are totalled, which gives *total effectiveness* per day. This tells us how good, regular or bad the performance of the shift was on a particular day. At the end of the

week we have the aggregated total and we calculate the average. This represents effectiveness in that week, both partial and total.

The partial and total effectiveness table gives a variety of readings that can be used as a basis for analysis and at the feedback meetings to generate proposals for improvement.

ENTERPRISE 'X'
PARTIAL AND TOTAL EFFECTIVENESS
Production Department

Week 1

	Turno 1						Turno 2					
	Idle time	rejects	safety	clean. order	absent-eeism	Total	Idle time	rejects	safety	clean. order	absent-eeism	Total
Monday	40	20	0	50	0	110	50	30	0	100	100	280
Tuesday	60	40	100	0	100	300	55	35	100	50	0	240
Wednesday	30	15	-50	100	0	95	85	90	100	100	100	475
Thursday	-20	-20	100	-50	-100	-90	-30	-40	0	0	0	-70
Friday	40	30	100	100	100	370	50	60	50	50	100	310
Total	150	85	250	200	100	785	210	175	250	300	300	1235
Average	30	17	50	40	20	157	42	35	50	60	60	247

The first reading is per day and per shift. For shift 1 the best day was Friday and the worst day was Thursday. For shift 2 the best was Wednesday and the worst was again Thursday. In the light of this data we can ask "What happened on Thursday?"

The second reading is a vertical reading by indicator. In both shifts the rejects indicator shows the least progress. In the "social" indicators shift 1 is below shift 2. These two aspects could lead to a more in-depth analysis about causes and possible corrective responses.

The third reading is of total effectiveness in the week. Here we can see that shift 2 achieved better results than shift 1. From a possible maximum of 500 points, shift 2 obtained 247 and shift 1 trailed behind with 157. Total effectiveness data can be accumulated over a given period, for example three or six months. This means they can be used as the basis for recognition or a previously stipulated prize for performance in the period. The incentive could be awarded in function of results per shift, that is to say the fact of having achieved a certain percentage above the target in the initial plan. Or the incentive could be in function of having emerged in first place on the list. Alternatively the two criteria could be combined.

There are different criteria for establishing a prize or incentive. The simplest is to base it on total effectiveness. This means assigning equal weight to all the indicators that are taken into account.

A more complex criterion would be to take the process indicators since it is these that have a direct impact on costs and hence on financial results. The social indicators are taken as conditioning factors, so each would have at least a positive average partial value.

Another option is to award a prize or some sort of recognition in function of the results of each indicator taken separately. For example, for least idle time, for safety, etc. The advantage of this approach is that it is more likely that participation will be greater in both shifts as each will have its own particular strengths. One shift will have a better safety record, another will do better as regards time lost, and this will cover a wider variety in the mosaic of how things really are in the production area.

The model is very flexible not only in terms of the integration of variables or indicators but also when it comes to interpretation and analysis. Its use will depend on what the organization considers most suitable bearing in mind its culture and the objectives it has set.

If the organization is large the model can be expanded in proportion. For example, in a middle sized enterprise like a sugar refinery, the production department is made up of a number of areas (mills, boilers, production, maintenance) and each has three shifts. For each area the objectives, indicators, measurement units and effectiveness anchor points (-100, 0 and 100) are established. Suppose the matrix of indicators and effectiveness has 23 productive or technical process indicators and 4 social ones that are repeated in each area and that behave as mainstreamed indicators (cleanliness and order, safety at work, accidents, absenteeism).

The procedure to convert measurements into effectiveness points and then to construct the effectiveness matrix for each area follows the same logic as that outlined above. The model is flexible so it can be expanded without difficulty.

EXAMPLE OF INDICATORS AND EFFECTIVENESS MATRIX: SUGAR REFINERY

SYMAPRO Matrix Indicators	**INDICATORS 2004/2005 HARVEST**	Date: Harvest: Shift:

DEPARTMENTS	PROCCES INDICATORS	-100	0	100
BATEY MILLS	IDLE TIME *	15´	10´	5´
	MILLING RATE	300	315	330
	WASTAGE IN BAGASSE	2,6	2,3	2,0
	HUMIDITY IN BAGASSE	52	50	49
BOILERS	VAPOR PRESSURE	20	21	22
	PETROL CONSUMPTION ** LT/C	2.5	1.5	0
CLARIFICATION	PH ALCALISED JUICE 7.2 TO 7.8	7,1	7,4	7,8
	PH CLEAR JUICE 6.8 TO 7.2	6,7	7	7,2
	% WASTAGE IN FOAM	3,0	2,5	2,0
	TEMPERATURE OF JUICE	100	103	105
	PH SULPHITE OF JUICE	5,2	4,8	4,5
	CLARITY OF JUICE	25	30	35
EVAPORATION	LEVEL GRADE BRIX MELADURA	60	65	70
CRYSTALISATION	PURITY OF TEMPLE A	82	84	86
	PURITY OF TEMPLE B	75	73	71
	PURITY OF TEMPLE C	58	56	54
CENTRIFUGATION	PURITY OF SEED B	90	93	95
	PURITY OF SEED C	86	84	82
	PURITY OF FINAL HONEY	38	37	35
DRYING, PACKAGING AND ZUGAR	HUMEDITY	0,06	0,05	0,04
	ASHES ***	0,24	0,23	0,22
	METAL PARTICLES	6ppm	4 ppm	4ppm
ELECTRIC DPT.	IDLE TIME P/Shift	10´	5´	0´
	SOCIAL INDICATORS	**-100**	**0**	**100**
ALL DEPARTMENTS	1.- ABSENTEEISM (Absences)	2	1	0
	2.- CLEANLINESS AND ORDER (Points)	1	3	7
	3.- SEFETY (Persons without helmet and shoes)	2	1	0
	4.- ACCIDENTS	1	*	0

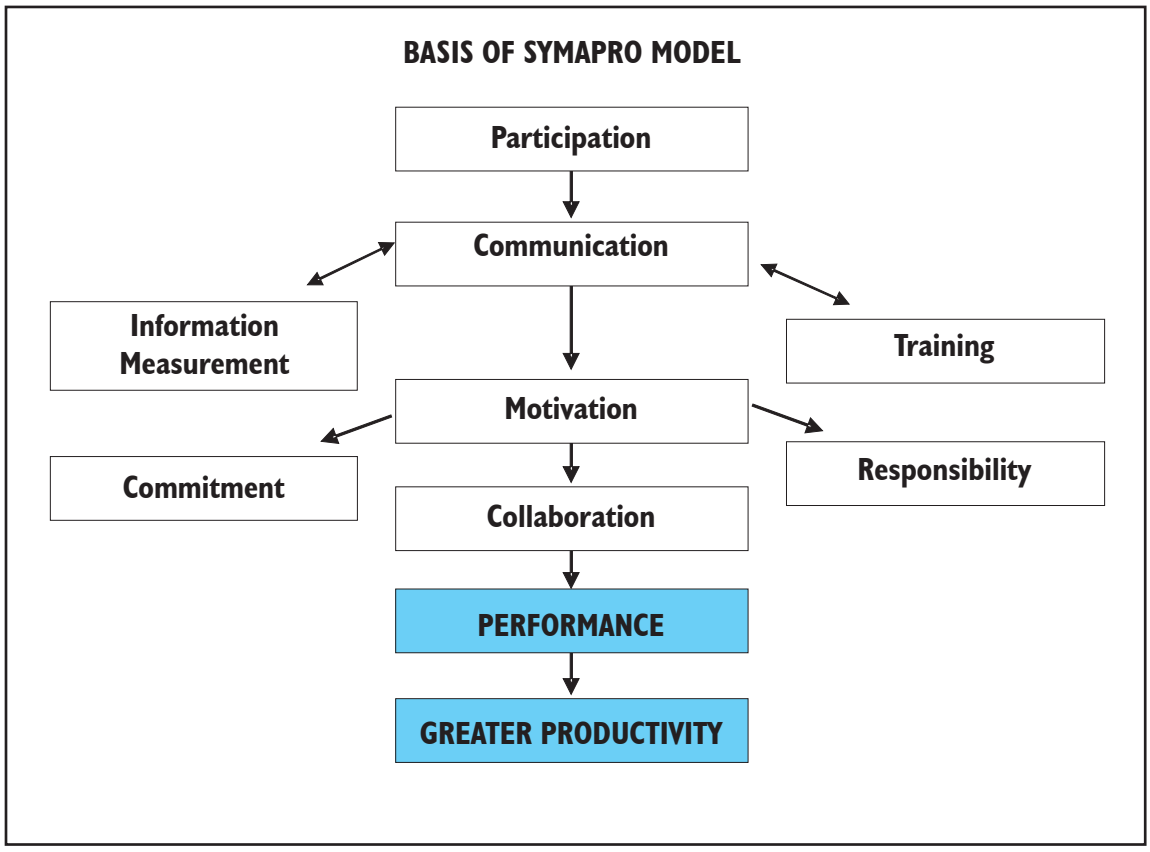
CLEANLINESS AND ORDER

1.- GREASE-FREE HANDRAILS
2.- NO OIL ON FLOORS AND DRAINS
3.- NO RUBBISH, PAPERS, BAGS, STEEL WOOL, ETC.
4.- LOOSE METAL (SCREWS, NUTS, SHEETS, ETC.)
5.- NO OBJECTS IN PASSAGEWAYS OR STAIRS
6.- NO SMOKING
7.- NO WATER MOPS

* IDLE TIME INCLUDES ALL DEPARTMENTS
** NOT DIRECTLY RESPONSIBLE FOR CONSUMPTION
*** ASHES INDICATOR THAT CAN BE DETECTED FROM CRYSTALLISATION

How are objectives and indicators determined?

The core of the SYMAPRO is participation. Communication stems from this, and is strengthened with the information (including the results of measurements) provided, and training for technical, organizational and social understanding in the organization. This means greater motivation for commitment, collaboration and responsibility, and this in turn makes for better performance and hence increased labour productivity in the organization. This is the basis of the model.



A small family enterprise producing ice cream in the city of Santiago in the Dominican Republic implanted the SYMAPRO in 2000 to improve workforce productivity. With guidance from advisers from the National Institute of Vocational Training (INFOTEP), there were weekly workshops with staff to construct the indicators. At these workshops not only were the objectives and indicators defined, but also operational problems and solutions for them came to light. Some of these problems were idle time at the start of production every day, the fact that workers were not wearing protective equipment, and hygiene deficiencies in handling the foodstuffs.

To solve the first of the above, the workers proposed reducing the time needed to prepare the mixture, and this made for a significant improvement.

Source: INFOTEP (2000), "Experiencia de Helados Noris". http://www.oit.org.mx/simapro/html/sectores/01_01.html

To clarify the objectives to be measured in the initial stage of SYMAPRO implementation, a workshop is held to visualise problems and the solutions that may be most effective. Representatives from middle and senior management take part, and also operational workers and representatives form workers' organizations. Areas of opportunity are sketched out in relation to the function that each person performs and there is cross-referenced interpretation of these functions and an analysis of their validity and viability. This generates confidence to start on the task of measuring objectives, and this process fosters a commitment to improvement on the part of all the members of the organization.

In line with the logic of the model, the objectives, indicators and effectiveness values are determined in a participative process that involves the personnel from the area in question and managers responsible for strategy in the organization.

Participation requires a SYMAPRO facilitator or coordinator to guide the process. In this stage the facilitator has a twofold role. First, he has to ensure that the objectives of a particular area are in line with those of the organization and that they include everything that the area or group should contribute to the organization.

Second, he has to get the staff and management involved in that area to take part, which means operational personnel, middle management, senior management and the unions. In the case of processes that are closely interconnected, clients and internal suppliers should also be present. For example, in a sugar refinery the objective of the milling department is closely connected to boilers and production, because what is beneficial for the organization as a whole is to achieve and maintain equilibrium between these departments. This may mean that one particular department is not operating in an optimal way, but from the perspective of the whole organization it is doing so.

The *objectives* of an area or work group are defined in a participative process, which in itself is very good training. It helps to explicate for everybody involved why the area exists. What does the area contribute to the organization? Or to put it another way: What are the critical activities that, if they are not done well, would "hurt" the organization? Answering these questions can mean a discussion of the organization's mission, vision and values. Or there may be an analysis of the organization's strengths, opportunities and weaknesses, and the threats it is facing. This helps in defining critical objectives and concentrating on the most important ones.

There should be between three and six objectives per area, as this is a manageable number but still enough to cover needs. Some will be process objectives and others will be social. The process objectives usually have to do with costs (efficiency) and quality, and the social ones with health and safety at work, cleanliness and order, and attendance. The objectives are described in terms of an expected result like achieving top quality in the assembly of printed electronic circuits, for example, or keeping the work area clean.

Criteria for defining **good** objectives for the group:

1. Clear formulation.
2. If the group achieves the proposed objective, the organization benefits.
3. Scope has to be total: all significant aspects in the area have to be included.

After objectives have been defined, the next step is to define indicators for each one, and this too is a participative exercise.

The indicator is a concrete measure in time of how well the group is attaining the objective.

In the facilitation process the group will have to answer key questions such as: How can we measure whether we are doing our job well in the group? What should the concrete measures for each of the objectives be? The answers to these questions may give rise to more than one indicator, and there may be different levels of aggregation.

The selection of indicators does not necessarily have to be based on what is already being measured. Perhaps what is currently being measured was implanted by other parts of the organization (engineering, planning) and does not necessarily correspond to the proposal to improve productivity by motivating the personnel in the area in question. All those involved should be aware of what is being measured, and in a system to improve productivity it is essential for the model to be relevant to the real situation.

What is measured in the SYMAPRO model must be a result that is controlled by the group. If an indicator does not depend, or only minimally depends, on the group's performance, the members of the group will become de-motivated and the system will be less effective. It is not always possible to find an indicator that is 100% under the group's control, and in fact this would be an exception rather than the rule. The challenge is to identify indicators that depend to a large extent of the group's performance, and accept that there will always be a dimension that is outside their control and depends on other departments or areas.

For example, in an enterprise that bottles and distributes purified water, one efficiency indicator for the distribution area is to cover the clients along a route that is set every day, and

The paradox…

What is measured in the SYMAPRO system must be under the group's control, but productivity is the result of numerous factors. One of these is human, but the others are technology, the organization, investment, and so on. It is unrealistic to expect the SYMAPRO to become the main factor in a holistic improvement in productivity. It is a tool that enables human resources, the people in the process, to combine their abilities and talents with other resources to bring about a real improvement in productivity.

to do so within the working day. Sometimes there may be problems with traffic that make it difficult to complete the route on time. Another problem is that there could be a delay filling bottles at the plant.

In the milling area in a sugar refinery it is debatable to what extent the indicator of "wastage in the bagasse"(sugar that has not been extracted from the cane and remains in the bagasse) depends on the efforts of the workers in that department. There are numerous external factors that have an influence on this indicator, like the quantity of earth that arrives with the sugar cane, or how fresh the cane is. Some sugar refineries have opted to leave this indicator out of the system. Others include it, with the argument that in spite of these external factors the result of the indicator depends sufficiently on the work of the operational staff in that department for it to be included in the SYMAPRO.

It is difficult to find a set of "pure" indicators for a group or department. When it comes to social indicators, results largely depend on the behaviour of the group (cleanliness, for example), but there will be situations when the result does not depend on the group but is conditioned by some other circumstance or a policy in the organization. We have to accept these grey areas, so the question is: To what extent? If the standard is applied too strictly there will be situations in which it might seem unfair to attribute a certain result to the group. On the other hand, if application of the criteria is too slack the results will seem unimportant for the organization. Take the absenteeism indicator for example: one of the organization's objectives is to reduce absenteeism, but first it must be clearly understood what is meant by the term. Missing work may be justified or unjustified. If an individual is ill or has prior permission, which includes permission to take time off for union business, then the absence is justified. If the absence is for reasons outside these categories than it is unjustified.

Criteria for defining **good** indicators for group objectives:

1. The totality of indicators defined must cover all objectives, and each must be covered completely.
2. They must be valid: what is measured is a precise index of attaining the objective (in the short and middle term).
3. The group can control them.
4. Measurement is not expensive.
5. They are understandable and meaningful for the group.

The criterion of restricting the indicator to the group's area of performance depends on each individual organization. In some cases the prevailing criterion will be that problems should feature regardless of whether they are a consequence of what the group does. In other cases the criterion is geared more closely to results that depend directly on the group. In either case there has to be a regulatory

mechanism as to how the indicators are managed so that they involve values that the group understands. Indicators acquire meaning from a collection of codes that are constructed with staff participation, and in this process the SYMAPRO coordinator or facilitator plays a crucial role.

Establishing good indicators is one of the most difficult parts of the SYMAPRO. Organizations differ from each other, but they still have similar indicators. In a manufacturing industry the recurring themes are production per hour and/or efficiency, and these can find different expressions such as production per person, per raw material input, per labour cost, etc. In the context of lean production there will also be indicators linked to time (response time, waiting time, cycle time, etc.) and to process quality (zero defects, wastage and reject rates).

On this last point there may be critical variables to control, such as levels of Ph in products in the foodstuffs processing industry, for example. The objective would be to maintain Ph levels within a set range, and the indicator would measure Ph in that range (or conversely the indicator could be expressed as a negative value, capturing measurements outside the range).

Another class of indicators capture job completion in stipulated time, and these would be applied in maintenance work, for example. In this area job content varies greatly, and what is measured is degree of progress on a set programme. This is common in sugar refineries. They have a processing period in which work is gauged by the degree of progress on a programme.

Many different kinds of organizations require measurements of unforeseen events, especially in the field of on-the-job risk. This kind of risk is reduced if protective equipment and clothing is worn and if people behave in safe ways to avoid accidents.

Most organizations share the objective of achieving client satisfaction in all its various modalities. What is difficult is how this can be measured because to do so sometimes involves a cost (for example, a survey to determine client satisfaction with a product or service), or a gap between the time when the measurement is made and the time when the product or service is generated, or the fact that non-satisfaction is not measured completely (for example, in the area of complaints made by clients there will be some dissatisfied clients who do not make a complaint).

When there is an interrelation between the results of different departments or groups, it will be necessary to establish an indicator for both, or to have different indicators that are analysed jointly in the feedback meetings so as to avoid one department taking corrective measures that affect the other's area. It is also necessary to avoid having one group analyse a problem that is a consequence of what another group does or fails to do. For example, in a sugar refinery there is a very close inter-relation between the milling area and the boilers area: if the former delivers bagasse that is humid or insufficient in quantity, the latter will find it difficult to produce vapour with sufficient pressure or quality, and this has

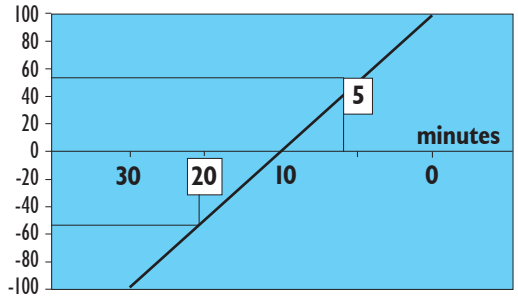
a negative effect on refinery operations. To avoid having one department blame the other for low indicator results, in some enterprises meetings are held at which both groups are present.

How are effectiveness points determined?

This is probably the question that generates the most controversy when the model is implemented for the first time. Effectiveness expresses the degree to which an expectation is fulfilled. In this case the expectation can be defined as the objectives set and the degree of commitment shown. The expectation could be a stipulated level of efficiency to be achieved (for example, to reduce idle time lost to less than ten minutes per shift), the preservation of a certain state in the work environment (cleanliness, safety) or the satisfaction of a client (internal, external).

Example of conversion

5 minutes of time lost is equivalent to 50 effectiveness points; 20 points to -50 points



The question that arises is: Whose expectation is taken as the basis to determine the anchor effectiveness values (100, 0 and –100)? In the SYMAPRO, expectations are constructed through a process of dialogue and analysis in which senior management, middle management and operational personnel all participate. Explicit variables are involved (production capacity, estimated demand, the cycle of preventive maintenance, the quality of raw materials, etc) but there are also intangible factors, those the people involved know from experience but that are difficult to quantify or define in an isolated or individualised way. A mixture of intuition and experience is involved in defining what can be achieved, and in this process different variables are implicitly taken into consideration. The dialogue between individuals from different strata in the organization yields an approximate value for what can be considered an excellent result (+100), one that is regular or in accordance with the plan (0) and one that is considered the worst possible scenario (-100).

The argument for using this approach for defining the values of the indicators is: Who knows the real (positive and negative) parameters of the productive process better than the personnel actually involved in it (in different levels and positions)?

When defining effectiveness points, one point of reference is the figures from the organization's recent history. Another contributory factor is people's perceptions and estimations of what values can be expected from the indicators for the

work cycle or season that is about to start, the cycle for which the values of the effectiveness anchor points are being defined. In these estimations, changes that have been made to teams, systems and the type of product all have to be taken into account. The zero effectiveness point could be equivalent to reaching the target levels of the plan, so long as this target was set using criteria for what was genuinely achievable in "normal" work situations and under normal market circumstances. The positive effectiveness values reflect the extent to which real results are exceeding plan levels, and negative values reflect the extent of the shortfall with respect to plan targets.

One question that frequently arises is that indicators may vary during the measurement period. For example, the harvest season for a sugar refinery has an initial period of about one and a half months in which the raw material (sugar cane) has not yet reached its optimal condition, and at the end of the season there is a period of decline. This circumstance affects most of the indicators. The question is: Should the effectiveness reference points be corrected in each period of the harvest, or should there be just one effectiveness value for the whole season? The latter alternative was chosen because it is very difficult to make a precise estimation of when one sub-period ends and another begins since the transition is continuous. In other cases, in the clothing assembly industry for example, the parameters of the high and low seasons can perhaps be gauged with greater precision, so having a separate effectiveness reference value is justified.

Usually the rule is that the indicators defined should have as little variation as possible between measurements and their corresponding effectiveness points. If one given value of measurement corresponds to zero effectiveness points, this should not vary over the period set for the measurement cycle. If it does vary, due to situations in the context (in the market for example) or changes in the quality of the raw material or for some other reason, the suitability of establishing shorter measurement cycles would have to be considered, or alternatively the suitability of accepting this variability within certain limits and taking it into consideration at the time of interpretation.

Who does the measuring, and how are measurements processed?

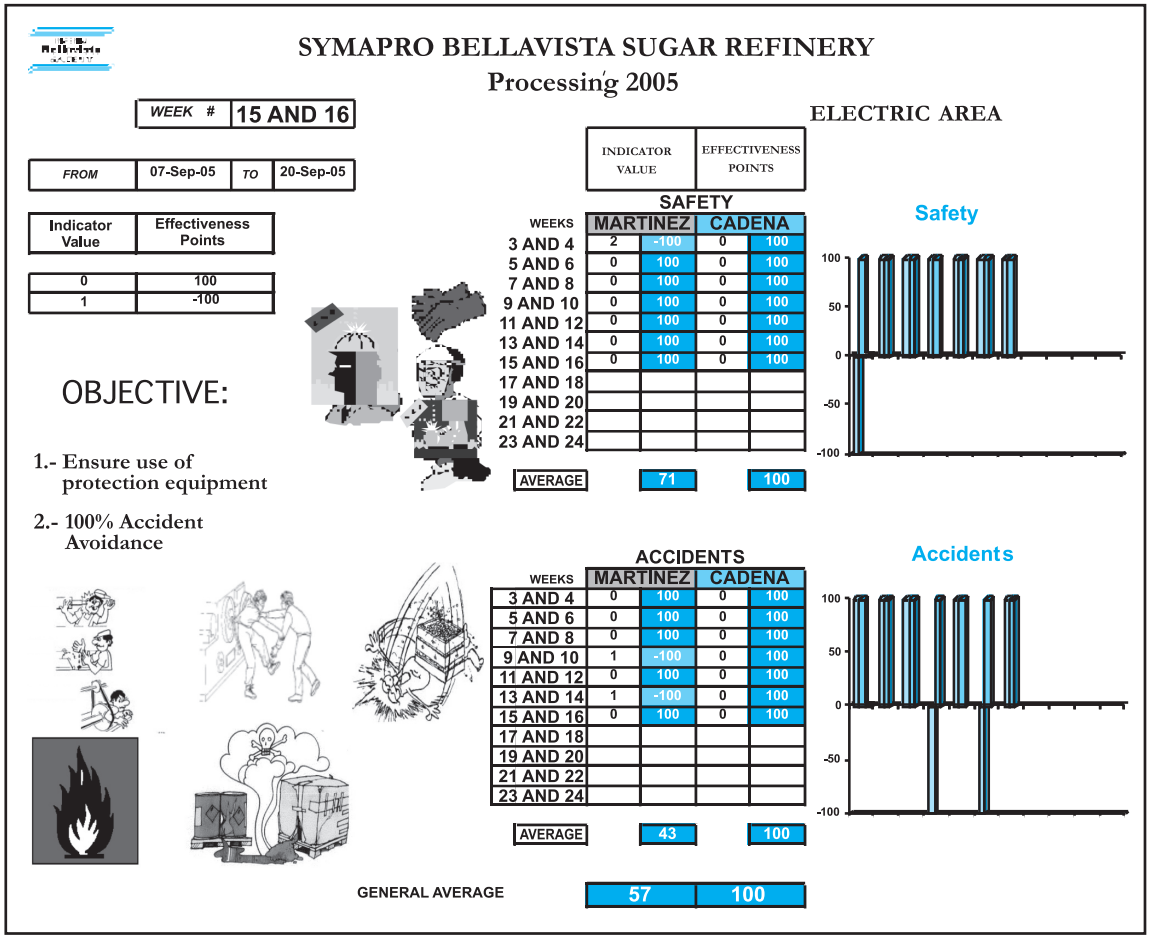
There are two extremes when it comes to the measurements derived from the indicators. One is for all measurements to be made by someone external to the group or area, so the person who does the measuring does not have a functional relation with the group or area the indicators apply to. At the other extreme the measurements are made by the staff of that area themselves, and they may even subsequently process the data.

There are advantages and disadvantages to both systems. In the external system, the person who makes the measurements will be more objective, and this reduces the likelihood that he might subtly alter the figures or be influenced by immediate

circumstances. The disadvantage is that the personnel in the area in question are not involved in the measurement process and they could interpret the final result as something imposed on them, or not be conscious of what each measurement really represents.

At the other extreme, the situation in which the members of the group themselves participate in the measurement process; the advantage is that not only do the measurements become meaningful for them but there is a more favourable environment for generating a commitment to improvement. The measurements can be made jointly by the supervisor and one or two members of the group, and the very act of making measurements and passing the results on to the data processing system is in itself a training experience. The disadvantage is that sometimes the judgement of the individuals who make the measurements can be clouded and may not be objective or critical, and this prejudices the value of a measurement so it may turn out not be meaningful for the group or for the organization.

This has happened above all with social indicators for cleanliness and order and the use of personal safety equipment. In the former, cultural aspects have an influence. Cleanliness and order are not usual habits; to be able to establish a criterion about this the personnel first have to grasp the notion of what represents cleanliness and order. In the latter, there is a permissive attitude of "let it go" because "...it happens to all of us that we forget or we don't use the safety equipment when we don't feel the need…"



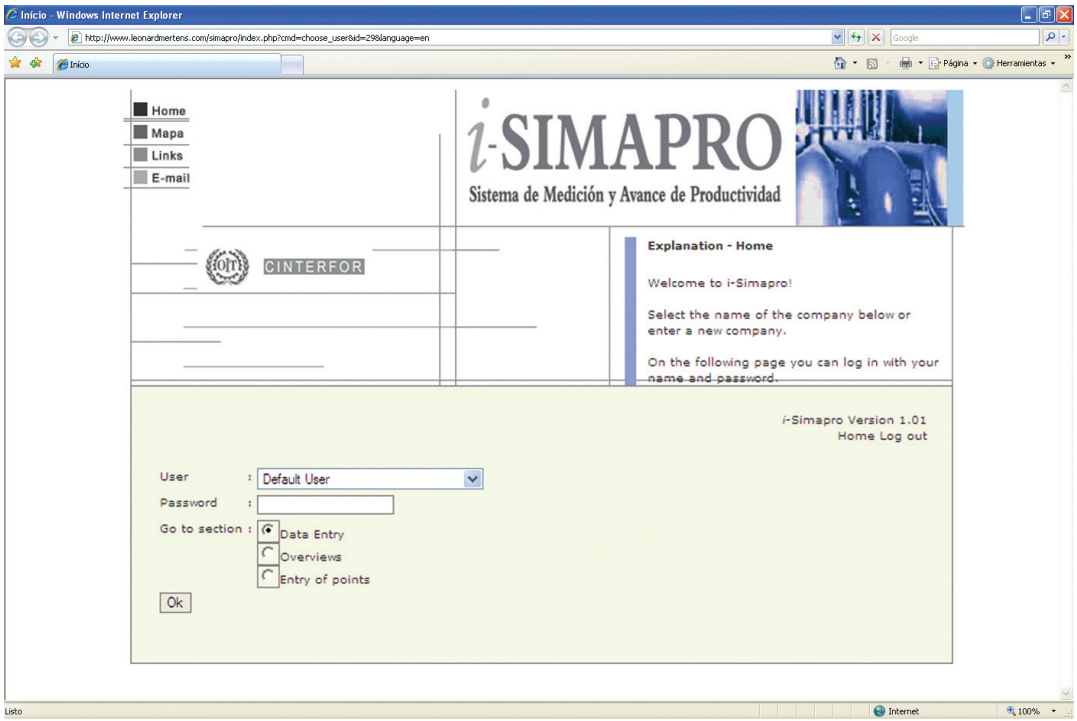
Apart from these two extremes there are intermediate modalities. For example, measurements for process indicators can involve personnel participation, based on the information generated by the administration area, the laboratory or the quality department, as the case may be. But when it comes to social indicators, a third party should be brought in to do the measuring. In some cases a cross auditing system is used whereby personnel from one area make the measurements in another, and people from the second area check the first. Another possibility is to use the staff responsible for quality or safety in the workplace, or to have a mixed committee if this is possible in the organization. This helps to make the measurements more objective and therefore more valid.

Once the measurement has been made, and this may be daily, weekly or even monthly, depending on the indicator, the information is processed.

The person responsible for carrying out and/or coordinating this activity is the SYMAPRO coordinator-facilitator in the organization. In some organizations the supervisors in each area along with one or two operational workers feed the measurements directly into the system, with assistance from the coordinator.

The measurement results are processed on a spreadsheet such as Excel. Examples of forms are available at the SYMAPRO web site (www.oit.org.mx/simapro). Alternatively, the data can be processed using software based on the *I*-SYMAPRO Internet platform, which enables the user not only to process the measurements but to register the results at feedback meetings and generate many ways to handle and present the information so it can serve as the basis for evidence registers in quality systems of the ISO type, and also for portfolios in skills-based management systems.

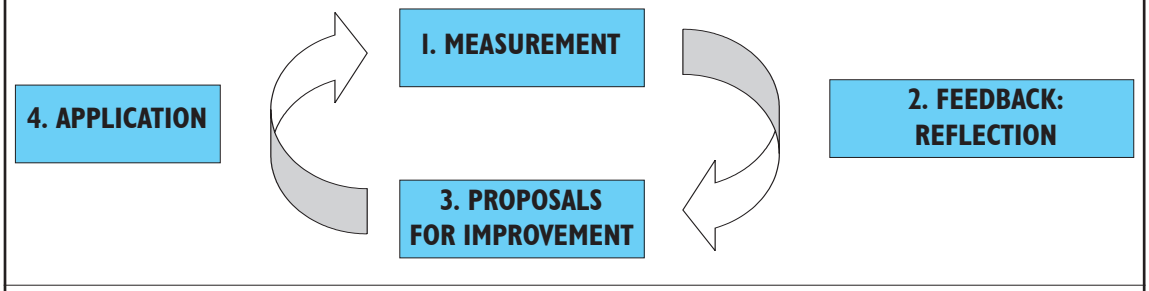
www.leonardmertens.com/simapro.



FEEDBACK SYSTEM COMPONENT

What is the SYMAPRO feedback component?

The SYMAPRO is made up of four parts. The first is measurement, the second and third are feedback and improvement, and the fourth is implementation. The four parts are interconnected. Based on measurements, the staff know and are conscious of the point where the organization's productivity is located. This enables them to set priorities for making improvements. The steps taken to bring about improvement are evaluated again, in the light of measurements, so a "virtuous" process of continual improvement is set up.



"Reflection and training generate improvement!"

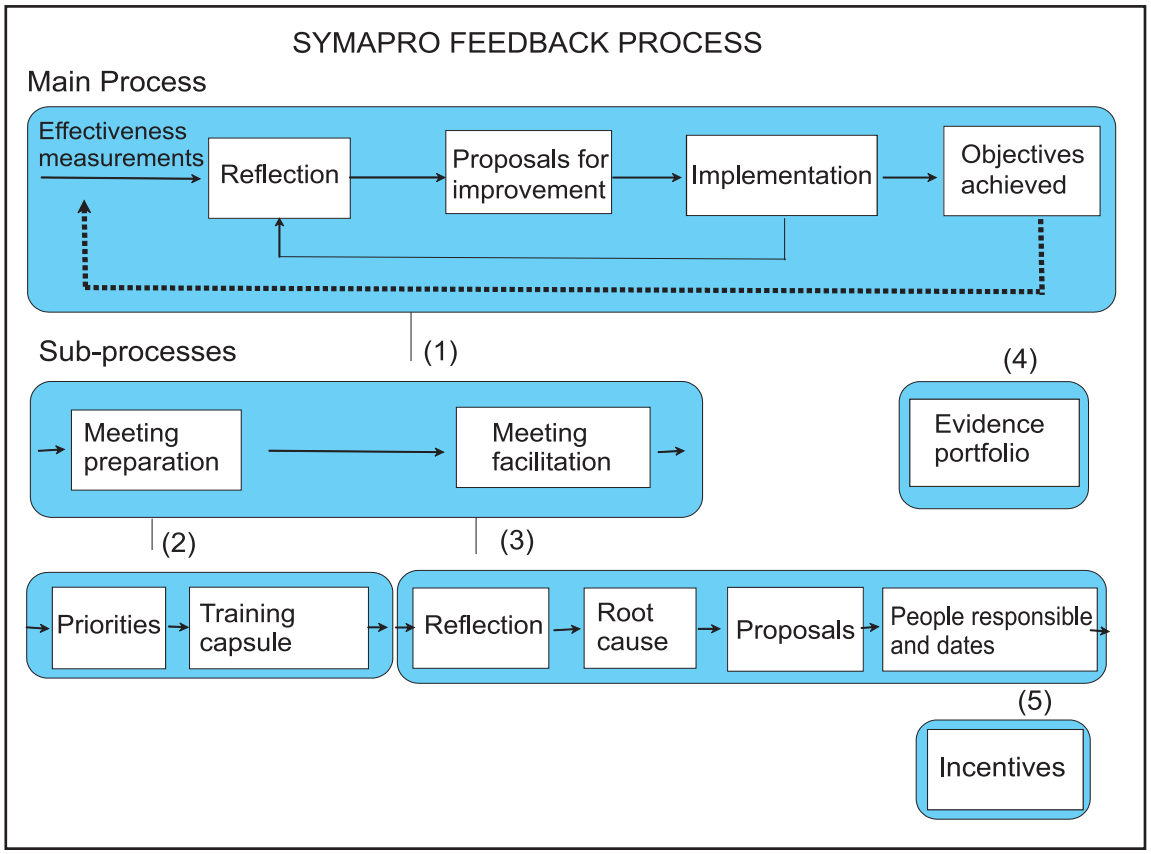
Main process: Reflection and improvement proposals

The feedback system is made up of two key parts. The first is reflection about the results of the measurements and the training capsules, and this process must reveal the root causes of the problems and/or opportunities that have been identified. Reflection also includes follow-up on previous improvement initiatives that are in the process of being put into practice, and evaluations of their impact through measurements of their effectiveness.

Why a "feedback system"?

Feedback about the results of the measurement of effectiveness is a "social" system, and there are two reasons for this. First, it is made up of various parts that are interconnected and that, as a whole, generate a result. The proposals for improvements require previous reflection by the members of the group, and this is influenced by subjective factors, by previous proposals and their implementation, and by the task of preparation.

The second reason is that the feedback system depends on interaction with the environment. It functions because there are conditions in the organization (culture, strategy) that allow it to do so. At the same time it influences the environment (in management, in the union) and changes it, because it is capable of differentiating itself from it.



The second key part of the feedback system is the definition and selection of proposals for improvements. An individual is assigned responsibility for carrying out each proposal, and the proposed action has a completion date. This involves concrete commitments about the effectiveness points to be improved, and the results are presented at the next feedback meeting.

The feedback system can be represented in a main process diagram that sets out a series of steps leading from one component to the next. Effectiveness measurements are the inputs for reflection, this is the input for generating proposals for improvement, these in turn are the inputs for the implementation of these proposals and this means *experimentation* (to a greater or lesser extent) which leads to the attainment of objectives or, if the proposal was not implemented or not successful, to a return to reflection. The criterion for measuring the achievement of an objective is effectiveness.

In the SYMAPRO it is important to clarify the aim or goal that the organization wants to reach. If objectives are not well defined, then improvement for improvement's sake is not very efficient and can lead to unwanted results.

Reflection is a key phase in the learning process. It is the time when the improvements that are expected as a result of the SYMAPRO emerge. Good reflection is not easy because it means questioning the routine that the department or work group is following. It also means inquiring into why the dysfunctions, problems or errors that affected the production process in the period occurred.

In this kind of questioning it is very easy for the group to be deflected from their real purpose, and this can happen in various ways. First, group members and the facilitator can get lost in the sheer quantity of measurements, or they might not make the effort needed to analyse the problem to the required depth because they assume there is no other way to do things and that the cause lies in some other department or someone else's domain.

The second way is what might be called "a dialogue with the deaf", in which the expert or facilitator claims he is right and "proves" his point by arguing from the theory. Or similarly, the operational worker might claim he is right with arguments based on knowledge derived from practical experience. If both sides remain entrenched in their positions there is no effective dialogue and the process will stall. The same happens when members of the group insist on complaining about basic questions like working conditions or the availability of tools and do not consider how these are managed, and a situation develops in which nobody will shift from his initial position.

A third way in which constructive dialogue can be derailed is when the facilitation process or the group's learning process is not rigorous. If there is no evaluation or recognition of the quality of facilitation or the learning achievement of group members, it is difficult for the feedback process to become deeper or more meaningful.

A fourth potential problem is that the group members' expectations might not be met. They expect to share in the benefits generated by the improvements that flow from their team effort (this may or may not be explicitly stated) and they might be disappointed. This could be de-motivating and so impair the effectiveness of the feedback.

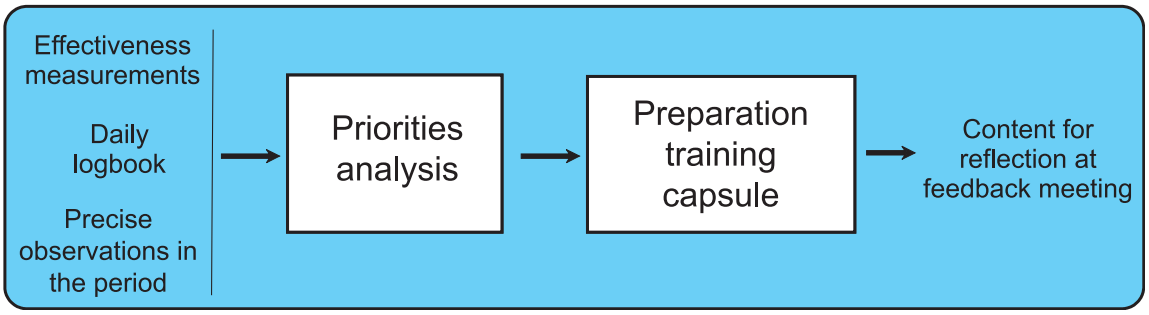
To guard against the risk that the feedback meetings might fail to generate reflection that leads to proposals for improvements, two sub-processes have been established on a second level to support the reflection and improvement proposal components. These are preparation of the meeting and facilitation of the meeting.

Both involve a series of steps and are supported by two further sub-processes to assure feedback quality and fair benefit distribution, (a) there are portfolios of evidence about the participants' skills at the meetings and the improvements implemented, and (b) the components of the incentives system are integrated into productivity improvements in a period that terminates when the cycle finishes.

We shall now examine each of these four sub-processes in greater depth.

1. Preparation of the feedback meeting.
2. Facilitation of the feedback meeting.
3. Keeping evidence portfolios.
4. Incentives system.

Sub-process 1: Preparation of the feedback meeting



The preparation of the feedback meeting sub-process consists of two components: an analysis of priorities and the preparation of a training capsule. These generate a contents base for reflection at the feedback meeting.

With inputs from the effectiveness measurements in the analysis period, the information in the daily logbook and the precise observations of the work carried out, the facilitator of the feedback meeting, who is usually the supervisor of the work group, prepares (preferably one day beforehand) the content to be discussed at the meeting.

This preparation consists of identifying and choosing some critical aspects of what happened in the period in question, taking the effectiveness results, the logbook and the observations as a frame of reference. Preparation also includes a review of the proposals for improvement that have been fully implemented and those that are still under way. Aspects to do with process indicators can be differentiated from those in the field of social indicators. It is recommended that not too many aspects be dealt with because a tighter focus on just a few will allow the group to discuss these in greater depth. These critical aspects are dealt with at the feedback meeting, and the main support tools in this process are effectiveness graphs that are projected for the group to analyse. The process of reflection about the measurements can begin with these critical aspects.

The facilitator prepares a training or teaching capsule to foster in-depth reflection and to reinforce good practices (techniques, habits) or new policies (of quality, for example) among the personnel. The content of this capsule focuses on the critical points that have been selected but this is supplemented with a holistic vision (Which of the organization's objectives does this point affect?) that includes social aspects.

How are the critical aspects chosen?

Example: The indicators for the time period show there was an increase on 4 of the 14 days under analysis. In the logbook there is a report of a problem with changes to the styles of the product, and the social indicators show a fall in the cleanliness and order indicator on Wednesday and Thursday. These two questions will be analysed at the feedback meeting.

"The SYMAPRO supporting ISO implantation"

A sugar refinery traditionally lacking social integration planned to introduce the ISO quality system.

The SYMAPRO had been initiated previously so the personnel rapidly identified with the proposal and cooperated with everything involving ISO installation.

In another case, the feedback groups explained to the staff in each area, systematically and related to indicators, the processes that have to be controlled applying the procedures and, when necessary, proposing improvements.

For example, if the critical problem is to make changes in the styles of the product with less loss of quality or efficiency, the content of the capsule might begin with the cost of the product and the quality the client expects in the context of a strategy to respond more quickly to changing demand in the market. Then it could move on to technical details about how to make a change of style rapidly, and conclude with the subject of interpersonal communication and cleanliness and order, as social supports for the strategy.

Another example is involving personnel in the introduction of a quality system of the ISO type. Training capsules about aspects the operational staff will have to handle in the quality system are prepared. This raises awareness about the policy to be implanted and creates an opportunity for the people who have to apply it to express their opinions, which helps instrumentally in the process of the proposed changes to come.

A criterion to select an indicator to analyse at a feedback meeting could be:

1. the indicator that slipped back most in the period
2. the key indicator at that time in the organization
3. the leading indicator in the area, which is significant for the other indicators
4. an indicator in which there is a clear incidence of intervention by persons
5. an indicator for a programme in which each indicator will have to be analysed (in sequence).

The didactic technique also has to be defined. What works best in a variety of contexts is to prepare some closed questions, this is questions that give only two options: correct or incorrect. This is suitable for fast learning environments in which all the personnel have to make an effort to reason, understand and

Programme of Meetings
SYMAPRO Feedback Meetings

Date	Day	Francisco	Miguel	Genaro
25 January		14:00	12:30	12:30
8 February		12:30	14:00	12:30
22 February		12:30	12:30	14:00
8 March		14:00	12:30	12:30
22 March		12:30	14:00	12:30
3 April		12:30	12:30	14:00
19 April		14:00	12:30	12:30

EXAMPLE: DIDACTIC INSTRUMENT FOR THE TRAINING CAPSULE
CRITICAL SUBJECT OF THE MOMENT: RETURN OF BAGASSE

ZUCARMEX

SYMAPRO
SYSTEM FOR THE MEASUREMENT AND
IMPROVEMENT OF PRODUCTIVITY

BOILERS FEEDBACK MEETING: 04-05 HARVEST
2 MARCH 2005

1. Dry bagasse increases pressure
   false **true**
2. You must make sure the bagasse that returns is dry
   false **true**
3. Returning humid bagasse benefits the boilers when they are very hot
   false true
4. Maintaining petrol at 25 pounds of pressure below the vapour in the burners benefits us
   false **true**
5. there is no need to wear protective glasses when you leave the area to collect some material
   false true

make a direct connection to actual work practice. The content has to be adjusted to the theoretical and practical training level of the people involved.

Another didactic technique is to show a photograph, drawing or technical sketch and ask each person in the group to identify some problem or opportunity with it. For example, at a feedback meeting in a sugar refinery the participants were shown a photograph of a fissure in a metal support in a transmission system, and asked to identify what it was, comment on the risks involved, and say what should be done about it. In this way learning for personnel can be alternated with techniques to maintain motivation.

These two elements in preparing the feedback meeting, selecting priorities and preparing a training capsule, are the inputs to bring about good reflection among the members of the group. They are the basis for drawing up the agenda, and this helps to keep order and imposes a sequence on the meeting.

Example of Feedback Meeting Agenda:

- Welcome participants
- Follow-up and evaluation of commitments from previous meetings
- Results of effectiveness measurements in the period
- Analysis of critical points in measurements and improvement proposals
- Training capsule: subject I
- Proposals for improvement stemming from the capsule
- Other business
- Close meeting

Sub-process 2: Facilitation of the feedback meeting?

The feedback meeting is the core of the SYMAPRO. It is the time when knowledge is shared and created (knowing, knowing how to do and knowing how to be) in the work group in a systematic, participative, integral and inclusive way. The success of the SYMAPRO largely depends on the quality of the feedback meetings. In this context, quality is defined by the criteria mentioned above and by being *meaningful* in terms of the learning that is generated so it can provide a reference framework for action. This last aim calls for something more than being systematic, participative, integral and inclusive. The challenge is to achieve a *motivational context* that is derived from social interaction among the members of the work group, so that everybody knows each other's motivation, that is to say each person's motivation posture is known to all. This makes it possible for the improvement proposals generated by the members to actually be put into practice in the group's activities and routines.

The importance of the motivational context:

In the process of developing knowledge about the motivation of each member of the group, what is shared is not only what they do (praxis) and what they reflect and think about the group, but also, and most important, what they want to achieve as a group.

The development of "wanting to share" begins with subjective reality and ends with objective reality. It begins with personal experiences and ends with agreements and commitments to group objectives.

Combining the sharing the praxis with reflection and wanting in a process that goes deeper and deeper provides the basis for a learning community.

They key question is: How can social interaction in the group be brought about? And this leads on to: How can it be maintained?

The experience of several years of search and experimentation has yielded some determinant conclusions, but perhaps not enough to answer these two questions.

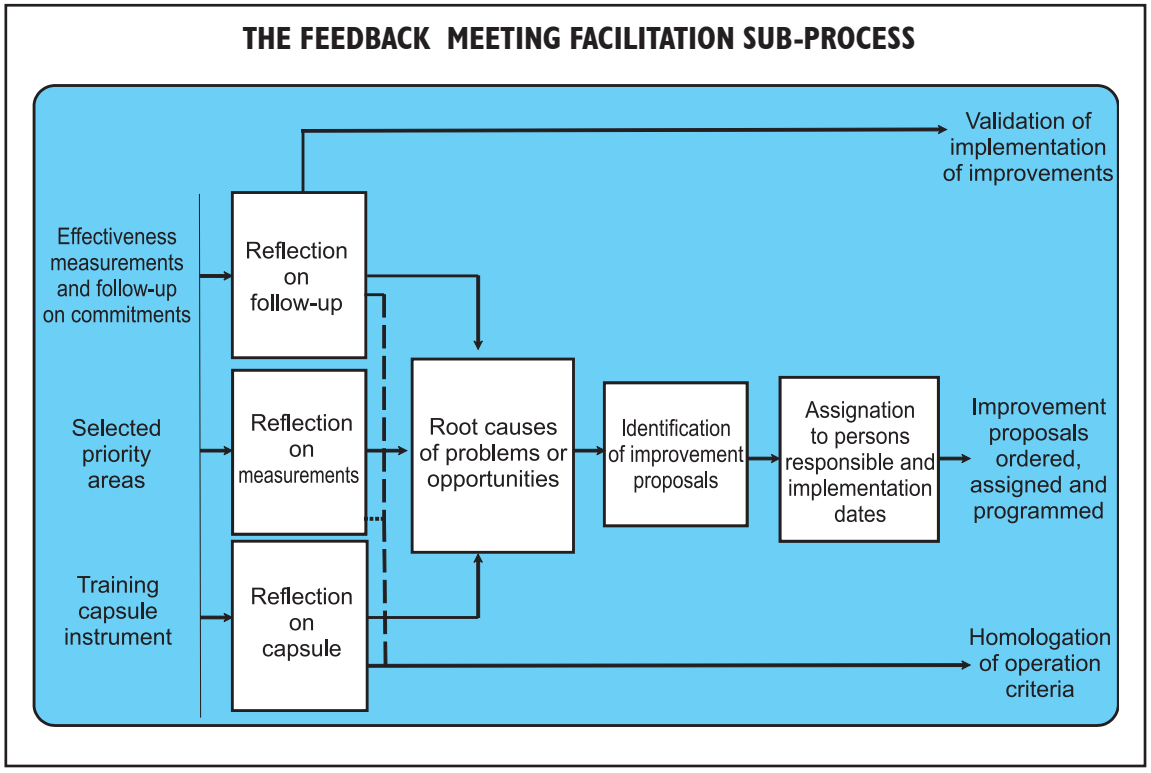
A first conclusion is that the social interaction must be credible for the group members. What they remember from a meeting has to be put into practice in the workplace, and when it is not there must be credible reasons why not.

A second conclusion is that the social interaction must evolve and go to deeper and deeper levels. It should not become blocked at a superficial level that does not lead to changes in what the members actually do in their work.

A third conclusion is that the organization's policy must be congruent with regard to the SYMAPRO. If management, the administration, the unions and other key actors in the organization send out contradictory signals about the SYMAPRO, the system will become less meaningful for the personnel and will be more difficult to maintain in operation.

A fourth conclusion is that an atmosphere of knowledge-based dialogue among all the members of the group must be created so that genuine critical and constructive reflection about their day to day work can emerge. In this knowledge-based

dialogue there are no hierarchies as such. Each person's opinion is a different vision of the job depending on where he or she is in the hierarchy of the organization. A shift foreman or department manager in a given area will have more information and knowledge than an operational worker who is in charge of operating some equipment and just has specific knowledge. The aim of the feedback meetings is to generate interaction between these two levels of knowledge so as to make an accurate diagnosis of the factors involved in a problem or an opportunity. This diagnosis flows from collective group reflection so it is more likely to be correct than if only the manager or foreman makes the diagnosis, or only the operational worker.



For the feedback meeting to be effective and maintained over time, it should be supported by elements of the facilitation process that have been derived from an analysis of good practices.

The main inputs for the facilitation sub-process are as follows: (i) the effectiveness measurements for the period, (ii) the commitments to implement the improvement proposals defined at pervious meetings, (iii) the selection of priorities for the group to analyse, and (iv) the training capsule instrument.

The three components that the sub-process begins with are (i) reflection on progress in the implementation of improvement proposals and their impact on the indicators, (ii) reflection on the results of the effectiveness measurements for the period under analysis, and (iii) reflection on the content of the training capsule.

These reflections should bring to light the root causes of one or more problems and/or opportunities the group have identified, and they are an input for the

next component in the process, the definition and formulation of improvement proposals.

Reflection also leads to homologation in the criteria of how to operate, that is to say the standards involved. In a context of continual change it is vital to have a mechanism that maintains homologation among the operational workers as regards how they do their work. In some cases this comes from the top as an organization policy, in other cases it is constructed jointly with the work group members. Reflection serves to re-affirm these criteria over time.

About Reflection

Reflection is a process in which people view an experience from a distance so as to be able to weigh up its significance carefully and consistently, and draw inferences. It is related to learning, which in this context is defined as the creation of meaning based on past or present events, and this serves as the basis for future behaviour.

Reflection is an activity that involves identity, which in this case means the identity of the group. It is an exercise in observation and description of oneself, which sets it apart from the environment.

There comes a point at which reflection cannot continue, or it may even come to contradict itself.

The aim is not to reach this point but to accept that the exercise of reflection is just one more step in rationalising the social system of production in an enterprise.

Source: Daudelin (2000).

In practice there is a kind of superimposition of sub-processes. What often happens is that when the root cause of a problem has been identified an improvement proposal is formulated immediately. There is also a progression towards greater depth insofar as the subjects that arise in follow-up reflection recur in reflection about the measurements and the capsule.

After improvement proposals have been defined and formulated, the next component is to allocate each task to a person to be responsible for implementing it, and to specify completion dates. It is here that the group members show how committed they are to the action to effect improvements.

The feedback meeting results in a package of ordered improvement proposals, there is a person responsible for leading the implementation procedure for each one, and each proposal has a set completion date.

About the sequence of the components

There is no single process that must necessarily be followed for deciding on the sequence to tackle the various components at the feedback meeting. Some facilitators start with reflection about follow-up, then go on to reflection about measuring and finish with the training capsule.

Reflection about follow-up on putting the improvement proposals into practice generates another product that is important in the system. This is verification that the proposal has in fact been implemented, and confirmation that the expected impact (in terms of solving the problem or taking full advantage of the opportunity) was achieved.

The four components of the sub-process of facilitating the feedback meeting are as follows:

1. Reflection
   - Reflection about follow-up
   - Reflection about measuring
   - Reflection about training capsules
2. Root cause
3. Definition of improvement proposals
4. Allocation to persons responsible

1. Reflection

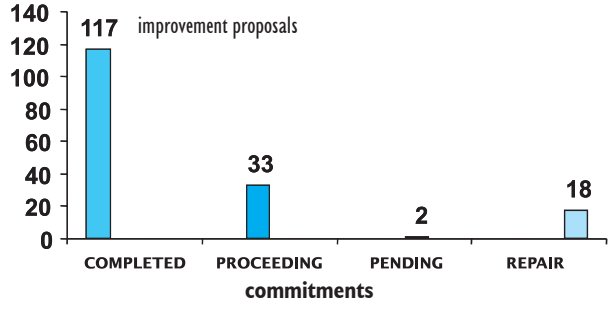
• Reflection about follow-up

Reflection about follow-up works two ways. The first is a check on the progress that has been made in putting the improvement proposals from previous meetings into practice. The second is a check on the impact these changes have had in function of their set objectives, either in solving a problem or taking advantage of an opportunity.

Checking progress is what makes the system credible. The group members themselves become auditors of the implementation of proposals, and at the same time they can see what they are creating. Both these elements contribute to giving them the motivation to go on generating ideas and making commitments to put them into practice.

One indicator of the effectiveness of the system as a whole is just this, the number of proposals generated, and above all the number that were put into practice. Better still is when there is measurement of the impacts these proposals generate. At the end of a measurement cycle, when the results obtained through the SYMAPRO process

Example: Enterprise with 170 proposals for improvements in the Measurement Cycle



are assessed, the number of proposals that were implemented is an important statistic in evaluating the system.

If a proposal that has been put into practice does not produce the expected results in the effectiveness indicators, the group will reflect on it again to seek the root cause and make adjustments so as to generate a new proposal. This will be followed up at the next session. If the problem cannot be dealt with at this level of the organization it will be passed on to the middle and senior management board, which constitutes a second level in the SYMAPRO system.

It may be that reflection about the implementation of a proposal brings new problems or opportunities to light, and these are analysed to identify the root cause and generate new proposals.

Part of the process of reflection about follow-up is to make a visual presentation of the results of changes in a particular area. The technique is to prepare "before" and "after" evidence and communicate this to the work group, and this motivates them to persist with the system because of the impacts it is generating. For example, photos can be taken before and after a change, or the measurements of a specific indicator can be used (e.g. accidents before and after, or waste before and after).

Example of form to show impact "AFTER" and "BEFORE"

Before

After

CHANGES

• Reflection about measuring

Reflection about measuring is based on observation of the priorities previously identified by the facilitator (who may be the supervisor of the area in question, or equally well may be an operational worker). He informs the group about the criteria employed to define these priority points. The aim of reflection about the measuring process is to formulate and implement corrective action to tackle deteriorating results on one or more indicators. But a parallel aim is to maintain uniform criteria for the group and their work area, especially when there are

recurring changes in the market, in technology, in the organization or among the staff. Sharing good practices is a potent and affective strategy in any context and above all if a context is very changeable.

Usually the observation of one measurement statistic does not by itself lead to reflection. This is one of the problems facilitators are faced with: How can group reflection be generated based on one figure? One typical mistake that recurs in this context is that the facilitator begins to answer the question and the group apparently follows him but does not comment. The easiest thing for the facilitator to do is remark that things are going well, and when one negative result arises he blames some external cause or says that it is difficult for the staff to get used to a new situation since "that is the culture" (for example in a cleanliness and order context). Another typical mistake is that some members of the group will keep returning to a subject that was dealt with at previous sessions, and perhaps it is not possible to make a satisfactory response at this time, but they keep insisting with no clear motive for doing so. This may lead the group to bog down and become trapped in a vicious circle.

One technique that works is that instead of the facilitator stating his opinion about some priority situation he can ask the group questions about it. But these should not just be the questions he wants answered; he should try to get the members of the group themselves to ask questions. This fosters the capacity to make decisions and take responsibility for the consequences.

The pedagogy of questioning

Learning from questions that the learners themselves formulate is a way to foster learning to learn. It enables people to develop the ability to think critically and act, which is vitally important in a context where decisions continually have to be made and the individual has to take responsibility for the consequences of what he decides.

Questions vary in different stages of reflection

Stating the problem. In this stage, questions are of the "what" kind because they help to describe the situation. For example: What happened? What did you see or feel? What was the most important thing?

Analysing the problem. Questions that help in this stage are of the "why" type. For example: Why is this important? "Why do you think it happened? "Why did you feel like that?"

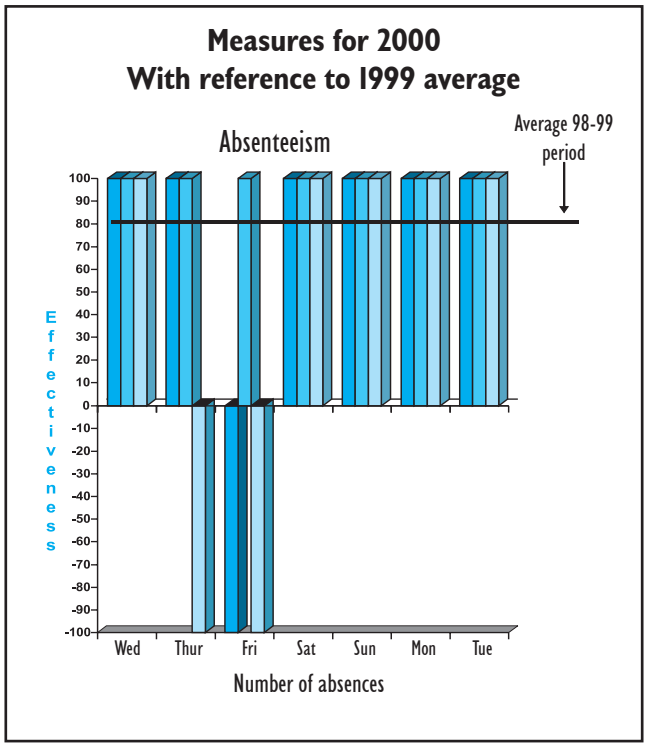
Generating a hypothesis and solution. Helpful questions in this stage are of the "how" type. For example: How could you do the activity or carry out the task in another way?

Formulation of action. Helpful questions in this stage are of the "when and what" kind. For example: When and in what way would you use this new technique to carry out the task?

Source: Author's adaptation from Daudelin (2000).

We might go so far as to say that this is not just about identifying problems or sharing good practices, it also involves generating the ability to take decisions using criteria, and at the same time to realise the limits of one's know-how and of what one can assume responsibility for.

In the process of reflecting about measuring, operational staff may criticise middle and senior managers, and some of these criticisms will be more justified than others. The opposite may also happen, managers may criticise operational staff, but this is more culturally accepted.



Management and workers' representative should handle this kind of situation tactfully. Criticism of this kind could be a sign that something undesirable is going on in the area in question, and suitable measures ought to be taken.

It is common in the early stages for operational staff to concentrate on demands for a series of resources that have never or rarely been provided in the past (for example, adequate protection equipment). This is normal in a situation open to knowledge dialogue, but the process should not become blocked at this stage. Once the organization has recognised and met the most pressing needs, the process should move on to wider issues and deeper levels of learning.

As time passes, the analysis of measurements may become routine and not very meaningful for the participants if this activity does not lead to changes in how the group carries out its daily tasks. To avoid this, pre-meeting preparation should be focused on critical points, and the session should be geared to going into greater depth about the factors underlying the situation.

It is also helpful to make comparisons with the results from a previous period. For example, if the average for the previous period was 82 effectiveness points, this can be used as a point of reference for analysing the new figure, and this keeps the group's attention focused on measurements.

• Reflection about the training capsule

The main purpose of the training capsules is to keep operational and performance criteria in the area in question (and in the organization as a whole) homologous. It is not enough to "inform" people about procedures or operational standards; the logic of why these criteria are employed should also be approached. In this explanation context, some content is derived from science or from formal or informal conventions within the organization, and these explanations are not complex. This is *quasi* univocal knowledge. In the foodstuffs industry there is a precise explanation for the value Ph must have in each production phase so that the final product will be of the quality required. Similarly, there is not much discussion about how an operative should hold himself or position his feet when lifting a heavy object. Nor is there about accepting the vision, mission and values of the organization because these are defined and agreed.

CLASSIFICATION OF SKILLS

- **Values:** organization culture column (for example, integrity, tolerance of failure).
- **Basic:** foundational (for example, writing, numeracy, calculation, analysis).
- **Generic:** social, emotional, personality (for example, communication, leadership, teamwork and analytic skills).
- **Transversal:** to do with processes (for example, general description and implementation of a quality system).
- **Technical:** regardless of a particular job (for example, generate resistance calculations and parameters, welding techniques, sales techniques).
- **Results:** of impact, and coordinated with the enterprise vision (indicators of efficiency, quality, innovation, cost).

In pursuit of the homologation of operational and performance criteria, one source of support can be a skills model that coordinates and guides learning in a way that is coherent and consistent with the organization's strategy. The architecture of the skills model varies depending on the characteristics of the organization.

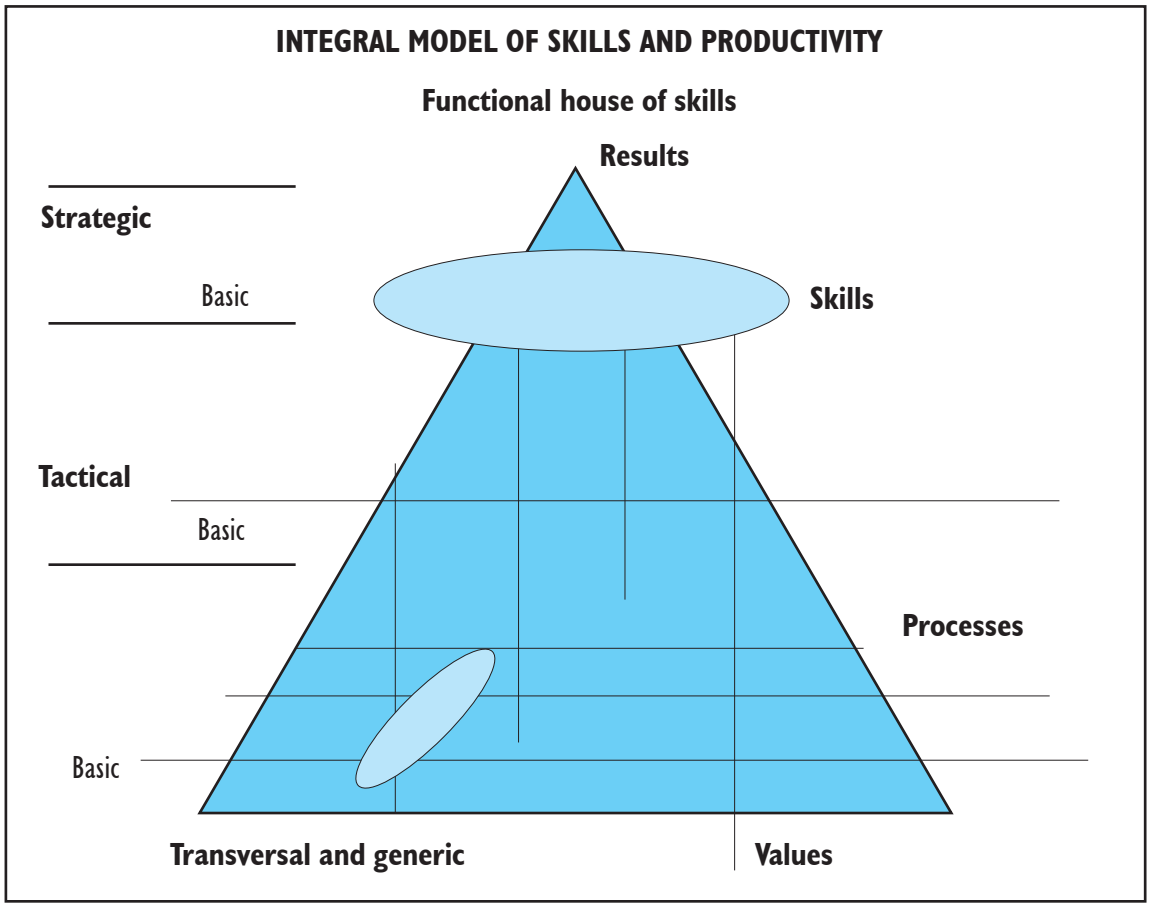
Skills models may differ as to their architecture and analytical approaches but they all share one common preoccupation, which is how to have an integral skills model for all the learning efforts in an organization.

This leads to another question: How should the content in the SYMAPRO training capsules be positioned in an integral skills model geared to raising productivity? In order for a training activity in a feedback meeting to be coherent and consistent over time it has be positioned in a conceptual model.

The architecture we propose here is that of a "functional house" that covers skills of various kinds and scope. These are (i) *values and social skills:* these have to do with the principles underlying how the enterprise connects with its context and

the people (for example, its stance on enterprise social responsibility, citizenship performance, (ii) *basic skills:* knowledge and skills that enable individuals to evolve and develop productively in a function (educational level, languages, computer skills), (iii) *generic skills:* these are abilities that are characteristic of the person and enable him to connect socially and productively in a function (effective communication, accepting challenges, analytic skills, negotiating skills), (iv) *transversal:* skills derived from processes that involve a large part or all of the organization (quality systems, the 5S, lean manufacturing, Total Productive Maintenance (TPM), skills-based management), (v) *technical:* skills that nourish productivity in an area but that are not restricted to just one specific work task (welding techniques, sales techniques, visual display of merchandise, calculating resistance, measuring vibration), (vi) *Results:* skills in the area of impact indicators that are in line with the organization's vision and strategic plan (SYMAPRO effectiveness indicators, balanced scorecard).

This categorisation should not be taken as a rigid or absolute system but rather as a tool to map the learning efforts that are deployed through training capsules at the feedback meetings.



Example: Planning format for feedback meetings and training capsules (Bellavista)

SCHEDULING OF SYMAPRO FEEDBACK MEETINGS 2005

Dates	Day	Batey and Milling	Boilers, Storage, Hygiene	Electricity	Preparation	Cent, Pumps, Workshops, Inst.	SUBJECT	NOTED BY
14-Jun-05	Tue	1						
15-Jun-05	Wed		1				QUALITY POLICY AND OBJECTIVES	QUALITY REPRESENTATIVE
16-Jun-05	Thurs			1	1	1		
22-Jun-05	Wed							
23-Jun-05	Thurs							
28-Jun-05	Tue	2						
29-Jun-05	Wed		2				OFFICIAL STPS, SSA STANDARDISATION	RELATIONS MANAGER
30-Jun-05	Thurs			2	2	2		
06-Jul-05	Wed							
07-Jul-05	Thurs							
12-Jul-05	Tue	3						
13-Jul-05	Wed		3				GOOD PRACTICES IN MANUFACTURING	QUALITY REPRESENTATIVE
14-Jul-05	Thurs			3	3	3		
20-Jul-05	Tue							
21-Jul-05	Thurs							
26-Jul-05	Tue	4						
27-Jul-05	Wed		4				TECHNICAL SUBJECTS	AREA MANAGERS AND SUPERVISORS
28-Jul-05	Thurs			4	4	4		
03-Aug-05	Wed							
04-Aug-05	Thurs							
09-Aug-05	Tue	5						
10-Aug-05	Wed		5				CONTINGENCY PLANS AND DANGEROUS WASTE	QUALITY AND ENVIRONMENT REPRESENTATIVE
11-Aug-05	Thurs			5	5	5		
17-Aug-05	Tue							
18-Aug-05	Wed							
23-Aug-05	Tue	6						
24-Aug-05	Wed		6				TECHNICAL SUBJECTS	AREA MANAGERS AND SUPERVISORS
25-Aug-05	Thurs			6	6	6		
31-Aug-05	Wed							
05-Sep-05	Mon							
06-Sep-05	Tue	7						
07-Sep-05	Wed		7				OFFICIAL STPS, SSA STANDARDISATION	RELATIONS MANAGER
08-Sep-05	Thurs			7	7	7		
14-Sep-05	Wed							
15-Sep-05	Thurs							
20-Sep-05	Tue	8						
21-Sep-05	Wed		8				TECHNICAL SUBJECTS	AREA MANAGERS AND SUPERVISORS
22-Sep-05	Thurs			8	8	8		
28-Sep-05	Wed							
29-Sep-05	Thurs							
04-Oct-05	Tue	9						
05-Oct-05	Wed		9				GOOD PRACTICES IN MANUFACTURING	QUALITY REPRESENTATIVE
06-Oct-05	Thurs			9	9	9		
11-Oct-05	Tue							
13-Oct-05	Thurs							
18-Oct-05	Tue	10						
19-Oct-05	Wed		10				METHODOLOGIES FOR 2005-06 HARVEST	AREA MANAGERS AND SUPERVISORS
20-Oct-05	Thurs			10	10	10		
26-Oct-05	Wed							
27-Oct-05	Thurs							
01-Nov-05	Tue	11						
02-Nov-05	Wed		11				ACHIEVEMENTS AND TARGETS FOR 2005-06 HARVEST	DEL TORO ENGINEER (Supte. Gral. Fca.)
03-Nov-05	Thurs			11	11	11		
09-Nov-05	Wed							
10-Nov-05	Thurs							
TOTAL MEETINGS =		11			Time	15:00 to 16:30		

NOTE.- *IN ALL THE MEETINGS PROGRESS IS ANALYSED, AND GOOD PRACTICES IN MANUFACTURING, SAFETY AND ACCIDENTS ARE MEASURED AND ANALYSED.*

But not everything in the organization is governed by univocal knowledge. One portion of the practices in organizations, and a part that is presumably growing in the face of the constant changes that these kinds of organizations are subject to, is the result of a collection of ideas, reasoning and stories about work experience that comes from members of the work group themselves. This kind of input is not usually stored or covered by formal routines, procedures, data bases or work methodologies.

Reflection about the training capsule is a step in this direction. It is an approach that stimulates the participants to reason and interpret, and it is sensitive to uncertainty, incoherence, multiple interpretations, contradictions and confusion. It includes and recognises ambiguity as a substantial part of the knowledge that makes up the organization. This calls for the management of ambiguity, and the training capsules at the SYMAPRO feedback meetings can contribute to this function.

It is recommended that, in order to handle this ambiguity in the capsule, a participative didactic approach should be used. One technique that has yielded good results is for some of the members of the group to direct the capsule component at the meeting, or for the participants to work in sub-groups with some instructions. It is important for all the members of the group to take part with their opinions, questions and conclusions.

About ambiguity

One effect of ambiguity is that the possibility of reasoning (clarifying cause and effect or making an educated judgement) is reduced. Various kinds of knowledge are important for an organization.

At one extreme there is theoretical knowledge that is formalised and codified.

At the other extreme there is knowledge about culture, interpersonal relations, intuition and experience, along with creative skills and talents. Between these two extremes there is a broad scale of possible combinations that characterise each organization.

In most problem-solving and knowledge-sharing situations an individual's unique experience and skills make the difference.

Analysis and reflection yield conclusions about the agreed criteria for how to proceed in practice in the situation in question. The result is homologation, insofar as this is possible in a complex situation in which there are ambiguities in the knowledge mobilised, to be able to proceed with the task in question.

Another result is that people recognise dysfunctional areas or opportunities, and these could be inputs for a subsequent stage, which is proposing action to bring about improvements.

It is recommended that both these aspects should feature in how the training capsule is handled to keep it focalised and oriented to improving process operations and working conditions. The capsule is evaluated not only on a conceptual level but also in practice, and this constitutes part of the portfolio of evidence about each member of the group to accredit the particular skill.

2. Root cause

How can we move from reflection to root cause? Reflection is based on the three components mentioned above, and each yields one or more root causes of problems and/or opportunities. In order to solve a problem or take advantage of an opportunity, there has to be a combination of various factors. The root is the factor or factors that sustain this situation. We recognize that it is not always possible or viable to reach the root cause, but before initiating any action we should ask ourselves whether we are just treating a symptom or if we are in fact dealing with the basic cause-effect relation.

One technique that has worked well for getting to root causes is for the group to ask the "*why*" question about the "*why*" questions. In other words, to go deeper into the *why* and the *why* of the *why* of the *why*. However, this is not always enough to reach a final answer. Sometimes we have to accept that the root cause is simply out of the group's reach. For example, suppose a management decision

made for budget reasons leads to the purchase of a replacement part that is cheap and not very durable. The question here is: What do we do with the replacement part knowing that it is of poor quality? Or, on another level: How can we work optimally in a situation in which there are limitations or restrictions?

The "why" technique has to be supplemented with the question "what to do in spite of", and then ask "why" again, to go deeper into the answer. In general the root cause is not one single factor but several that together constitute the root of the problem or opportunity. The "fish skeleton diagram" is a very useful instrument for identifying and visualising the factors that may intervene in the solution of a problem.

It has been found that in practice it is not easy to systematically apply a technique to break a problem or opportunity down into the elements that constitute the root cause. At the start of the process many problems come up whose solution is a simple corrective action or decision. Examples of this would be if fire extinguishers are not in working order, or if some machinery does not have a protective guard. Once these primary problems have been solved, more complex problems emerge, and these require methodical analysis to reach the root cause.

3. Improvement proposals

Improvement proposals can be classified into two types. First, there are proposals about a general goal to improve, and second, there are proposals for specific action in function of an analysis of the root cause.

Proposing improvement as a general goal consists of the members of the group agreeing to try to increase effectiveness points in a set period, like by the next feedback meeting or another convenient point in time. For example, if the total effectiveness indicator in week 6 reached 80 positive points out of a possible maximum of 300 points (3 partial indicators) the group might agree to try to raise effectiveness to 100 points by the next meeting, or they might agree to try to raise an indicator with a poor result by ten points.

The advantage of proposing a general goal to improve is that the learning effort the group makes is translated into results. This is a step forward from the concept of "group" to "work team", with everyone oriented to the goal of improving results. The strategy to bring this about is left to the group members themselves in the practical situation, or it may be defined through the use of learning instruments that they choose. This works when the group functions as a team and is provided with leadership by the coordinator or facilitator. But herein lies its disadvantage: it is not an option for just any kind of group. Another disadvantage is that there is no systematic follow-up on improvement proposal implementations as part of a trial and error learning exercise, so there is no process of consolidating the group's collective knowledge. And it may be difficult to maintain motivation

when the group makes an effort to change but does not see results because there are factors in the situation that they do not completely control. They may also lose motivation when the measurements are near the maximum possible because there is a limited margin for improvement, although in practice there will always be areas that can be improved.

The improvement proposal based on an analysis of root cause is focalised on critical aspects. It is based on a supposed analogy to the Pareto theorem, whereby resolving 20% of the most important problems will bring about 80% of the expected results.

The group analyses the various improvement proposals that come up in sequence during the analysis of the root cause of the problem and/or opportunity. In the proposals there is a mixture of different kinds of knowledge including theoretical, practical, conceptual, and to do with interpersonal relations and power in the organization. Participation is a key factor in this process. To the extent to which the members of the group express opinions, questions and proposals they are sharing knowledge of various kinds and from various sources. This process can even lead to the generation of new knowledge as the group passes beyond what was known up to that time.

Hence, generating improvement proposals becomes a reflection-action process. People's experiences are the source of proposals that lead to a significant impact on results, and these proposals are produced by the members of the group combining their aggregate knowledge. This is the advantage of this approach for specific improvements. First the group analyses different options and then they reach a synthesis or conclusion. Another advantage is that a systematic learning process is generated as each proposal can be followed up and corrected

Improvement proposals can have an influence on processes in the productive, administrative or human resources and labour relations areas. This can be seen in the example of an SME automobile painting enterprise in the Dominican Republic.

"These measurements have enabled us to identify the deficiencies that caused the enterprise to delay 8 days at the close of each month with regard to accounts to be paid. But today the time taken has been brought down to 3 and 4 days respectively, which amounts to a saving of more than 50%.

As a result of measuring and the evaluation of effectiveness indicators, the personnel department and general management have defined and implemented motivation strategies based on awarding additional marginal benefits including schemes such as food incentives, purchase facilities for school supplies for employees' children, and commercial credit facilities backed by the enterprise.

Another benefit of measuring and then evaluating the indicators is that the communication chain between personnel has improved thanks to employees having a greater understanding of the position each one occupies in the enterprise organigram. Periodic supervisors' meetings to evaluate these indicators have contributed to a more channelled flow of information between management, supervisors and operational workers."

Source: "Experiencia Empresa Acabados Automotrices S.A." (2000), INFOTEP, Santo Domingo, Dominican Republic.

if necessary. Moreover, the proposals can be noted and checked, this gives an indicator of the group's learning and so facilitates management of the group's continual improvement.

The disadvantage of this approach is that the relation between improvement proposals and the impacts they have on effectiveness measurements is "distant". In practice it is not easy to establish a causal relation between an improvement proposal which was implemented and an improvement in the effectiveness indicator. This is because effectiveness involves a holistic combination of factors that all have an impact, and one concrete proposal can hardly bring about instant improvements in all the factors involved.

Another option is to combine the two approaches, general goals and specific proposals, and this seems attractive since it means advantages can be added together to make a sum but disadvantages not because they are not exclusive of each other. This would help to focalise improvement proposals even more and at the same time to maintain capacity to systematically administer the learning process over time.

This combination of approaches is compatible with skills-based management, in which performance is defined as the product of skills demonstrated and results obtained. When this is applied to the context of improvement proposals in the framework of the SYMAPRO system, the performance of the group is the product of the proposals implemented and the results obtained. That is to say, the group's work performance improved because the members were able to generate and implement improvement proposals ("skill") and thus improve effectiveness indicators ("result").

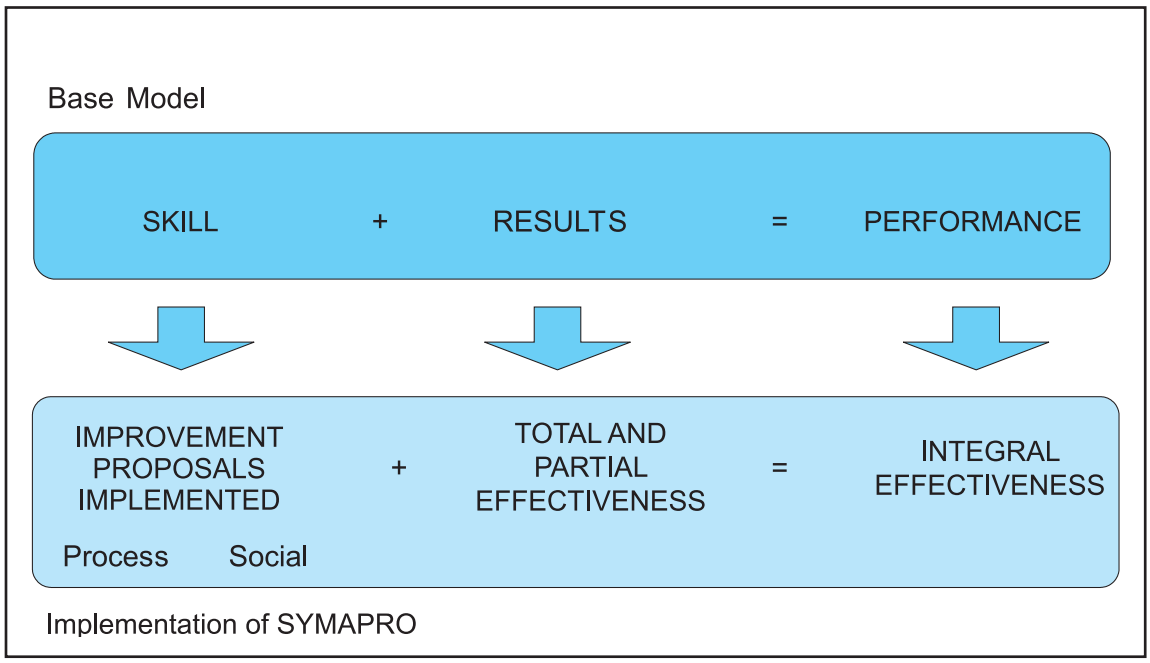
In the conceptual framework of skills-based management, the group's skills would be the ability to generate concrete proposals, and the implementation of these proposals would be the demonstration or evidence of those skills. Skills can be categorised as process or social, and there can be improvement proposals in both these dimensions. Each dimension can in turn be divided into sub-dimensions. The process dimension can be broken down into efficiency (costs) and quality, and the social dimension into behaviour at work (health and safety, for example) and behaviour towards work (absenteeism, for example).

The results are the partial and total effectiveness measurements, and when we have both skills and results we have performance. The question is: How can performance be measured when the measurements in the two dimensions have different bases? Performance can also be expressed as effectiveness. The anchor points for the improvement proposals implemented would have to be specified (the values of the indicator for the maximum and minimum points) and the corresponding measurements add up to total effectiveness, which is the measure of results.

For example, in an enterprise a result of 80 effectiveness points for performance over 6 months is calculated by adding up the total effectiveness of results (which generates 30 points) and the total effectiveness of the improvement proposals

implemented (which generates 50 points). We can call the effectiveness of performance INTEGRAL EFFECTIVENESS.

In this way we can construct an integral skills-based management model that coordinates the skills of the group with results. Individual skills can also be accommodated in the model, as we shall see below.



4. Allocation of responsibilities for implementing improvement proposals and documentation

When the group has generated improvement proposals the next step is to allocate the task of implementing these proposals to a particular person. This involves two key steps. First, the proposal has to be confirmed by management. This may be done at the feedback meeting itself if management representatives are present, but if this is not the case then management will have to be informed and permission obtained, especially for proposals that involve investment or changes in procedures.

Allocation to persons responsible…

When the SYMAPRO is starting, the typical procedure is to appoint one or two middle or senior managers to be responsible for the implementation of an improvement proposal. There are various arguments for this, ranging from "it is the bosses' job to solve problems" to "operational staff don't know how to do this, they are not prepared and it would be a waste of time".

The SYMAPRO proposes breaking with both these attitudes and sharing the responsibility for executing proposed action among operational staff, middle and senior managers, so as to achieve sustained learning by having people alternate between reflection and action.

The second key step is to select the person or persons who shall be responsible for putting the proposal into action. What is involved here is a participative model so the selection of who should be responsible for implementation should be shared between someone from the middle or senior management level and someone from the operational level. This helps to establish a commitment that is shared between operational staff and managers.

At the same time that a person is assigned responsibility for implementing the proposal, the date for completing implementation should be set and the necessary resources should be organised. This can be supplemented with a definition of the impacts expected and generated by the proposal. There should also be a register form for follow-up on the proposals with the name of the person(s) responsible and the termination date in each case.

The register form helps in administering the model and serves as a reference input for reflection about follow-up on the proposals. First there is a number. These run consecutively so they show how many proposals have been generated by the system. Then comes the problem and its root cause, the solution proposed, the person(s) responsible for implementation, the proposed completion date and the real completion date, the resources needed and/or utilised, and finally there is the expected impact and impact achieved. Some points in this form can be simplified, depending on the organization's policy. The recommended minimum is to have (i) number, (ii) root cause problem, (iii) proposed solution, (iv) person responsible, (v) proposed termination date, (vi) real termination date.

When this is done on a spreadsheet the proposals can be hidden without losing the documentation about them. In Internet-based software the consecutive list of proposals appears, so it is possible to go to the meeting of the group that generated the proposal and obtain more detailed information about how it originated and what the impact was oriented to. This means it is always possible to go to the source of a proposal, and this is particularly useful when tackling complex problems.

EXAMPLE OF FOLLOW-UP REGISTER FORM FOR IMPROVEMENT PROPOSALS

FEEDBACK MEETING				Date:		
				Shift:		
				Area:		
Nº	**Problem and root cause (WHAT)**	**Solutions (HOW)**	**Person responsible (WHO)**	**Start and finish dates (WHEN)**	**Resources used (WHAT WITH)**	**Expected and real impact (RESULT)**
1						
2						
3						
4						
5						
6						

EXAMPLE OF SIMPLIFIED IMPLEMENTATION FORM

ZUCARMEX CIA. AZUCARERA LA FE S.A. DE C.V. INGENIO PUJILTIC. S Y M A P R O	FEEDBACK MEETINGS	DATE: 27 - 28 MARCH HARVEST: 2001-2002 MEETING: 3

No.	PROBLEM AND ROOT CAUSE	SOLUTIONS	ENGINEER RESPONSIBLE	COMPLE-TION DATE	STATUS
7	DIRT BECAUSE OF LACK OF STEEL WOOL	PROVIDE STEEL WOOL NEEDED TO EACH AREA. MAKE A NEW ESTIMATION OF NEEDS TO PROVIDE STEEL TO AVOID SHORTAGES.	BERNARDO SALINAS	8.3.02	IN PROCESS
9	BAD STATE OF WALLS IN THE WEIGHING SCALES AREA.	PAINT WALLS.	IGNACIO YAÑEZ BORJA	10.3.02	IN PROCESS
10	PERSONNEL NOT WEARING HELMETS DUE TO NEGLIGENCE.	PERSUADE WORK MATES, GREATER RIGOUR BY FOREMEN, BUY HELMETS WITH ADJUSTABLE SCREWS.	IGNACIO YAÑEZ BORJA + CMU	12.3.02	IN PROCESS
11	FREQUENT DAMAGE TO BEARINGS IN SETS OF BLADES.	CHANGE LUBRICATION SYSTEM TO PREVIOUS SYSTEM (GREASE TO OIL). ALIGN AND BALANCE EQUIPMENT.	BERNARDO SALINAS	HARVEST	
14	DETERIORATED FACE CAUSED BY HIGH TRUCKS AND WITH LOSS OF CANE AT THE REAR.	PREPARE STATISTICS ON TRUCKS AND AGREE CORRECTIVE ACTION WITH FIELD SUPERINTENDENT.	ADRIAN ESPINOSA + RIVERA	12.3.02	STATISTICS PROCESS OF TRUCKS
19	MORE TIME LOST THROUGH LACK OF SPARE PARTS IN STORAGE FOR REPAIR OF CHAINS.	KEEP CRITICAL SPARE PARTS IN STOCK. REPAIR AND POSITION WIRE IN REFRACTION STORE.	JOSÉ MANUAL LEON + ADRIAN	20.3.02	IN PROCESS
20	NOT WEARING SAFETY BOOTS DUE TO LACK OF CORRECT SIZES	PROVIDE SAFETY BOOTS IN INTERMEDIATE SIZES.	YAÑEZ + MIXED COMMITTEE	NEXT REQUEST	
21	OLD WEIGHING SCALES CALCULATION SYSTEM.	RENOVATE WEIGHING SCALES CALCULATION SYSTEM.	FACTORY		
23	LOSS OF WATER FROM AUTOMATIC VALVES IN CANE WASHING SYSTEM.	REPAIR LEAKS.	JUAN LUIS MONTES	HARVEST	
25	LACK OF GOOD WATERPROOFS.	REQUEST GOOD-QUALITY WATERPROOFS IN LARGER SIZES AS THESE LAST LONGER.	YAÑEZ + MIXED COMMITTEE	20.3.02	
27	LOOSE METAL IN VARIOUS PLACES.	SET UP "5S" AREA.	ROSARIO + YAÑEZ + ADRIAN	5.4.02	

Sub-process 3: Keeping evidence portfolios about skills in the application and management of the SYMAPRO

Evidence is gathered on the skills defined. In this case, what are the skills? The skills are derived from the performance expected of operational and middle management personnel in the framework of the SYMAPRO.

For operational personnel the elements of expected performance are as follows:

i) to measure the effectiveness indicators

ii) to participate in reflection at the feedback meetings

iii) to generate improvement proposals

iv) to implement the improvement proposals

v) to apply the content of the training capsules

We will explain and give examples of how to generate evidence of these skills in the framework of the SYMAPRO below, in an application at the operational level and with references to middle management and the coordinator. This cannot be an exhaustive account; it is just an indication of what takes place at this level.

i) Evidence of knowing how to measure effectiveness indicators

Using the approach that skills are made up of a cognitive dimension and a practical dimension, evidence for both has to be generated.

For the *cognitive* dimension, the evidence to be demonstrated has to do with the basic elements of the SYMAPRO:

a. Relating the process and social indicators of the area or department to the objectives of the organization.

b. Specifying the unit of measurement of the indicators, their form of registering and their conversion into effectiveness points.

c. Describing the steps to reach total effectiveness.

d. Interpreting the results of partial and total effectiveness.

e. Presenting solution scenarios to deal with problems that arise in the measuring process.

The evidence to be demonstrated in the *practical or skills* dimension has to do with putting into practice the measurement of SYMAPRO indicators:

a. Applying the measurement of SYMAPRO indicators in accordance with the units defined.

b. Registering the measurement results in the appropriate format (manual or electronic).

c. Converting the measurement values into effectiveness points.

d. Registering critical incidents and their probable causes.

e. Consistently resolving measurement problems jointly with the SYMAPRO supervisor and/or coordinator.

f. Maintaining objectivity in the measuring process.

About the Measuring Skill

The measuring skill has three objectives:

a. For the collaborators to become involved in measuring the results of their work to make SYMAPRO their own.

b. The installation of a meaningful and systematic measurement culture integrated into a permanent learning project in the organization.

c. For the collaborators to become conscious about the coordination of the partial objectives in areas or departments with the general objectives of the organization, which facilitates the making of decisions in a congruent way.

The measuring skill is linked to the ISO quality system, to a system of skills-based management by objectives or to a system of measurement by objectives of the balanced scorecard type.

The Measuring Skill for the Coordinator or Area Supervisor:

For the SYMAPRO coordinator and the area supervisor, evidence of the measuring skill includes (apart from the elements mentioned above) the following:

Cognitive Dimension:

a. Establish the concept of effectiveness as the basis for measuring productivity.

b. Describe the steps to derive effectiveness indicator measurement units from objectives of the organization.

c. Explain the formula for converting measurement values into effectiveness points.

d. Describe the system for processing measurements.

Practical or Skills Dimension:

a. Apply the formula for converting measurements into effectiveness.

b. Keep the measurement register system up to date.

c. Process the measurements and critical incidents and generate visual reports (graphs).

d. Communicate results to collaborators in the areas (display windows, notices).

e. Resolve measurement problems in a way congruent with the bases of the SYMAPRO.

f. Evaluate the evidence about the collaborators' skill in this function.

These criteria for generating evidence can be specified and/or expanded depending on the organization's needs. It is recommended that they should be formalised and any changes should be documented. The aim is to achieve consistency in the measurement process.

The evidence about each of the criteria established is documented in the portfolio. The collaborator himself has to gather this evidence, with help from the facilitator, supervisor or SYMAPRO coordinator. When sufficient evidence has been collected it is evaluated. If it indicates that performance has come up to the required standard, the collaborator is accredited with the skill.

In the initial SYMAPRO implementation stage, this skill may serve for training the SYMAPRO coordinator and the area or department supervisors. The next stage is for these people to in turn become facilitators and evaluators of the collaborators in their respective areas. In this way the SYMAPRO is installed in the form of a "cascade".

ii) Evidence about participating in reflection at feedback meetings

The evidence to be gathered has to do with the skill of reflecting at the feedback meetings. In the proposed model there are at least three reflection situations, which are reflection about follow-up, measurement and the training capsule.

For the *cognitive* dimension, evidence is generated in relation to the following criteria:

a. Treating reflection as the core of individual and group learning in pursuit of continual improvement.

b. Identifying the reflection stage at feedback meetings.

c. Describing the forms of participation.

d. Explaining the "win-win" process and constructive criticism.

Evidence also has to be generated for the *practical* or *skills* dimension, and this consists of the following:

a. Asking questions and contributing ideas at the feedback meetings, about the results of the follow-up, measurement and training capsules.

b. Analysing and responding to other collaborators' reflections.

c. Demonstrating a constructive and purposeful attitude at the feedback meetings.

d. Maintaining a practical and viable approach in reflection.

Here again, like with the previous skill, the criteria can be adjusted in function of the organization's needs. In function of these criteria, the collaborator builds up a portfolio of evidence so this skill can be accredited after evaluation.

For the SYMAPRO coordinator and the supervisors, there is additional evidence about this skill that has to be gathered. This in mainly evidence about how the feedback meetings are managed. Activity in this area can be expanded because these meetings are so important in the SYMAPRO, but to maintain operational functionality in the evidence generation system they should be limited in line with some criteria.

In the *cognitive* dimension the following criteria are employed for the evidence to be generated by the supervisors and the coordinator:

a. Recognizing measurement interpretation techniques and set priorities in the framework of the SYMAPRO.

b. Relating reflection to individual and group learning.

c. Explaining the principles of the pedagogy of the questioning and root cause approach.

d. Identifying group management techniques in function of learning and continual improvement (knowledge dialogue).

For the *practical or skills* dimension the following criteria apply:

a. Preparing the feedback meeting, selecting priority aspects for reflection, derived from the effectiveness measurements.

b. Centring reflection in the area controlled by the members of the group.

c. Applying the technique of participative inquiry, which involves questions and the root cause.

d. Demonstrating an open and critical attitude, and establishing a knowledge dialogue with the group.

e. Maintaining fluidity and equity in the dynamic of the group.

f. Closing reflection phases with a concluding synthesis about the root causes identified.

g. Evaluating the evidence generated by the collaborators with regard to this skill.

The SYMAPRO coordinator and the supervisors will have to generate evidence in relation to these skill criteria. This evidence will be evaluated, so the collaborator can be accredited with the skill.

iii) Evidence about generating improvement proposals

Reflection leads to the generation of proposals that are relevant and attainable in the context of the organization's possibilities. Critical aspects in the generation of proposals are relevance, viability, congruence and the evaluation of the proposal's scope with regard to the problem or opportunity identified.

Evidence for the *cognitive* part of this skill relates to the following criteria:

a. Relating a proposal to the root cause.

b. Explaining the relevance, viability and congruence of a proposal.

c. Describing techniques for the solution scenario.

d. Identifying the scope and limits of a proposal and its possibilities of success.

e. Setting levels of impact in function of the SYMAPRO indicators.

Evidence for the *practical or skills* dimension relates to the following criteria:

a. Generating improvement proposals in the sphere of productive and social processes.

b. Making proposals in the light of the root cause.

c. Stating the elements of relevance, viability and congruence of the proposal.

d. Stating the solution scenarios of the proposal.

e. Stating the scope and limits of the proposal and possible degree of success, expressed in SYMAPRO measurements.

f. Take responsibility in the plan for executing the proposal, establishing delivery or proposal implementation conclusion dates.

g. Making a cost-benefit calculation or analysis of the proposal.

For the SYMAPRO coordinator and the supervisors, the criteria for the dimensions of the skill are very similar, but they go deeper in each case. These people have to provide evidence of a capacity to direct the group so these criteria can be maintained. This means being able to train the collaborators in the application of these criteria.

iv) Evidence about the implementation of improvement proposals

The proposals lead to an implementation strategy in which various members of the group will have to work together. The implementation of an improvement proposal generally involves the capacity to experiment and create in the execution procedure. The *practical or skills* dimension of the skill acquires more weight than the *cognitive* dimension.

The evidence to be generated with respect to the *cognitive* dimension relates to the following criteria:

a. Explaining different strategies to execute the improvement proposal.
b. Recognizing the availability of skills in the organization.
c. Locating the levels and channels of authorisation for the scheme and to obtain the resources in the organization.
d. Identifying risk factors in the execution of the improvement proposal (trial and error).
e. Describing the steps and registers to be completed in the execution of the improvement proposal.

As regards the *practical or skills* evidence, the following criteria apply:

a. Implementing the improvement proposal in the correct way and on time.
b. Working in a team to execute the improvement proposal, supported by internal and external capabilities in the organization.
c. Mobilising the necessary resources to implement the improvement proposal.
d. Controlling the risk factors in the implementation of the proposal.
e. Planning the steps of the implementation and of the evaluation of functioning.
f. Being creative in the implementation of the proposal.
g. Demonstrating tolerance if the proposal turns out not to function as expected.
h. Generating the intervention registers in the implementation of the proposal.
i. Evaluating the impact of the proposal implemented.

Like in the previous skill category, this evidence has to be generated by the supervisors, who along with the collaborators implement these improvements. Their role, above all, is to *lead* the process. Without this leadership the collaborators can hardly have this skill.

The role of the SYMAPRO coordinator is basically to *verify* that this skill is demonstrated, and to intervene to seek solutions when the implementation process runs into difficulty.

v) Evidence about applying the content of training capsules

The training capsules executed at the feedback meetings have to do with evaluation of the *cognitive* dimension. The collaborators collect these evaluations in a portfolio of evidence. The reference or criteria of the knowledge to be demonstrated is the capsule itself. Evidence about understanding the content of the capsule has a structure that is also in the realm of the architecture of "meta-skills", as explained above. It is as follows: (i) relation to the general objective of the organization, (ii) relation to an indicator of effectiveness in the area, (iii) technical content related to a process indicator, (iv) behaviour or attitude related to a social indicator.

As regards the *practical or skills* dimension, the evidence to be demonstrated is as follows:

a. Applying critical aspects of the training capsule, with agreement from the supervision level.

b. Evaluating the impact of the implementation on effectiveness indicators.

c. Proposing improvements in the content of the capsule and the way it is put into practice. d. Reporting the results of the implementation to the feedback meeting.

In this process the collaborator will have to involve an evaluator, who may be the supervisor or a specialist in the subject (for example, the safety specialist). The evidence generated is added to the appropriate portfolio.

The *cognitive* evidence the supervisor or facilitator has to generate is as follows:

a. Explaining the principles of skills-based training.

b. Listing the criteria to be used when selecting content for the capsule.

c. Describing the structure of the content of the capsule.

d. Explaining the different ways to prepare a training capsule.

e. Specifying cognitive and skills-based evaluation techniques and forms.

f. Explaining techniques to deliver the capsule.

The evidence with regard to the *practical or skills* dimension involves the following criteria, which the supervisor or facilitator must have:

a. Preparing the training capsule linked to an effectiveness indicator.
b. Using a content structure coordinated with effectiveness indicators.
c. Preparing knowledge and skills-based evidence evaluation forms about the capsule.
d. Delivering the training capsule applying skills-based training techniques.
e. Evaluating the evidence generated by the collaborators in relation to the capsule.
f. Evaluating the impact of the capsule on the effectiveness indicators.

The role of the SYMAPRO coordinator is basically to *verify* that this skill is present, and to intervene to seek solutions when the process runs into difficulty.

Conclusion about keeping evidence portfolios on SYMAPRO skills

The implementation of the SYMAPRO means the collaborators as well as on the supervisor, facilitator and coordinator have to deploy various skills. When the SYMAPRO is implemented at the operational level it is based on five skills. This is an approach that has to be reviewed in each case so the structure and content can be supplemented or refined if necessary.

There are still a number of questions to be answered about the evidence evaluation process generated by the different components of the system. In some cases evaluation involves an external third party, and in others it is internal. In any case, the evaluation procedure must be designed and described because this helps to ensure the quality of the process, and it also helps to assure the quality of the SYMAPRO model.

It is true that in the first stage of implementing the SYMAPRO model in an organization it is not so easy to establish portfolios of evidence about skills in the way described above, but the skills involved help to orient the process and make explicit just what is required from each person. As the system matures, the generation of evidence about the skills that underpin the measurement and feedback processes will help to make the system as a whole more consistent. However, it also makes the process of implanting the model more complex, so a fine balance has to be sought between progress and quality. This means making progress while accepting that the system is not perfect, and at the same time working for greater consistency.

Apart from the effort to make the process consistent, there is another reason to generate evidence: to help the people involved recognise their ability implement and sustain the SYMAPRO model in the organization. Evaluation of the evidence will enrich people's curricula, and this in turn will contribute to their professional development, either within the organization or outside it.

Sub-process 4: Integration of the SYMAPRO into an incentive scheme

One important way the SYMAPRO lends support is through its incorporation into an incentive scheme. This keeps the staff motivated to participate in the system and collaborate on the management of improvements. This reflects the "win-win" goal that underlies each of the SYMAPRO components and indeed the system as a whole.

An incentive scheme has two main modalities, the monetary or material, and the non-monetary. In the SYMAPRO the latter modality is present at all times since the collaborators are always listened to and involved in the processes, from the design of indicators and the setting of measurement parameters through to the implementation of improvement proposals.

As to the material aspect, there are various ways in which the incentive system operates. The first is the physical set up of the spaces where the feedback meetings will be held. When these spaces are in good condition, this provides an incentive for the collaborator to participate in the sessions, and it also reflects the importance the enterprise attaches to getting the collaborators to participate.

The second has to do with the scheduling of feedback sessions. These meetings can be held during working hours on a mixed time basis (half the time from the enterprise and half from the collaborator) or outside working hours. The former is preferable, but in some organizations this is not possible because the production process is continuous. In this case, the time the collaborators invest in the feedback meetings should be calculated, and the monetary equivalent of this, or a proportion of the equivalent, is added to the incentive scheme. It is preferable to make such payments at the end of a cycle under a system whereby the payment corresponds to good performance. In some cases incentives are given at each session, though a raffle among those who participate in the meeting, for example.

The third instance is to offer the participants a soft drink during the feedback meeting, and a snack or sandwich, depending on the time. These meetings are usually held at the end of the working day, when the collaborators are about to go home to have dinner, so a snack not only makes them feel better

and gives them energy but also helps to smooth out any interpersonal friction there may be and thus make the meeting more effective.

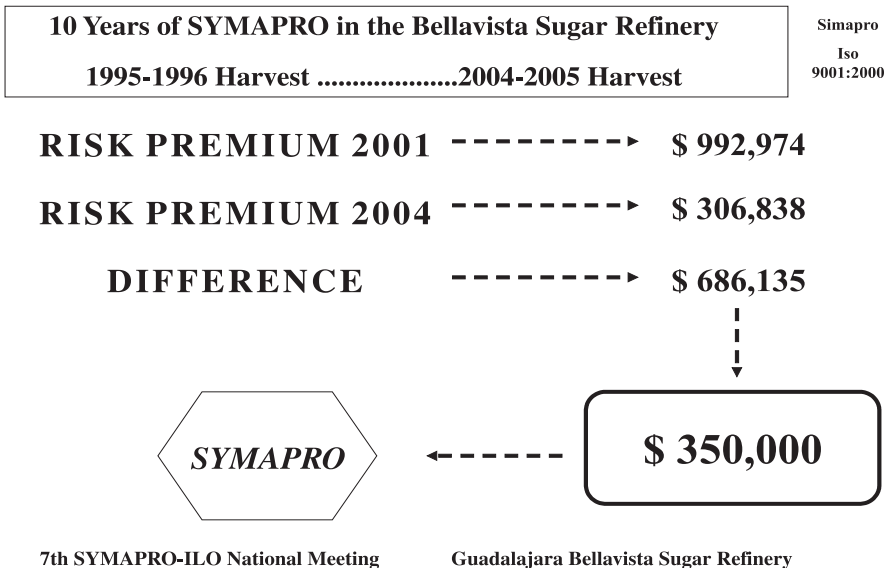
All of this makes a contribution, but the most meaningful incentive is probably the one awarded at the end of the cycle. In this there are two key events, the organization's general assembly in which everybody takes part, and the award of a material prize for performance during the cycle. The general assembly is when the participants' efforts are recognised, and it is a meaningful moment in the SYMAPRO. It is the time when what has been achieved through the system is reviewed, and it is also the starting point of a new cycle. The results of the global indicators of the organization are announced, and then the partial results by area or department. There is a review of the number of meetings held, attendance at those meetings, improvement proposals that were implemented and the main impacts achieved. Management and the union usually take advantage of this event to address all the collaborators with a message that emphasises upcoming projects in the near future. The general assembly usually closes with a lunch, which helps to bring the participants together.

What the collaborators most value and most look forward to is the incentive in the form of a prize. There are various systems. For example it could be a cash prize, canteen vouchers or articles for the home or for personal use (a bicycle, tools). The total value of the prizes varies. In some cases they are in proportion to volume and to the cost saving achieved, in others they are linked to quality or a reduction in work accidents. When there is a direct relation between effectiveness achieved and the hard indicators of sales and profits, it is easier to set the value of a prize, but it is more difficult when the process in question is continuous or semi-continuous, and the final result is a consequence of a variety of different variables.

In concrete experiences in process industries, monetary incentives have amounted to between 5% and 8% of basic pay in the measurement period, in situations in which there was a clear beneficial effect on the hard process and social indicators (accident reduction, for example).

One interesting example is the case of a sugar refinery that has been operating with the SYMAPRO for a number of years. There was a considerable reduction in the accident rate, and as a consequence the enterprise had to pay less to the social security system. There was a difference between the risk premium paid at the start of the experience and the premium after the SYMAPRO was implemented,

Example of SYMAPRO benefits distributed between enterprise and collaborators



and 50% of this was allocated to the system fund to pay current expenses (snacks, support materials) and prizes.

The criteria for awarding prizes vary depending on the organization and the kind of production process in question. The most common in experiences in enterprises with semi-continuous production processes are as follows:

i. Most effectiveness points attained, comparing the three shifts in that area.

ii. Attendance at feedback meetings.

iii. Number of improvement proposals implemented (this criterion is applied in some cases).

In this example there were three shifts per area, which meant it was possible to make comparisons between their results. All three shifts were awarded with an incentive at the end of the cycle, and the cash value of these depended on the department's and organization's global results. The shift with the best results got the biggest prize, the second best performer received the second prize, and the third the smallest.

A collaborator who attends more than 80% of the feedback meetings is entitled to 100% of the prize for his area. If he attended less than this, the amount of his award is reduced proportionally.

There are also prizes for the supervisors who act as facilitators at the meetings, and again these are linked to attendance, but preparing and conducting the meeting also have weight. In some cases the number of improvement proposals implemented is considered as well.

The sum of the prizes and running expenses of the SYMAPRO is based on an estimate of the cost of the programme during the cycle, but does not include the

expenditure involved in making the improvements or the time the collaborators invest in the meetings. The improvements implemented is based on an estimate of the benefits generated, although there will also be non-tangible benefits like the physical and social labour environment, which are difficult to quantify but important in the functioning of the organization.

EXAMPLE OF A SYMAPRO INCENTIVE SYSTEM

10 YEARS OF SYMAPRO IN THE BELLAVISTA SUGAR REFINERY

1995-1996 Harvest . . . . . 2004-2005 Harvest

Symapro Iso 9001:2000

INGENIO Bellavista S.A. DE C.V.

Cia. Azucarera del Ingenio Bellavista, S.A. de C.V.

FEEDBACK MEETINGS "SYMAPRO" 2004-2005

CRYSTALLIZATION

SHIFT: CONTRERAS — First Place

NAME	10-Ene-05	24-Ene-05	07-Feb-05	21-Feb-05	07-Mar-05	21-Mar-05	04-Abr-05	18-Abr-05	02-May-05	16-May-05	ASISTENCIAS	% ASIST	$
ALFONSO ESPARZA LOPEZ	*	*	*	*	*	*	*	*	*		9	100%	$700
JOSE RODRIGUEZ CONTRERAS	*	*	*	*	*	*	*	*	*		9	100%	$700
FAUSTO DE LA O MENDEZ	*	*	*	*	*	*	*	*	*		9	100%	$700
MARTIN PEREZ MEDINA	*	*	*	*	*	*			*		7	78%	$544
IGNACIO RAZON OCHOA	*	*		*	*	*	*	*			7	78%	$544
GUADALUPE ALVARADO VARGAS			*	*	*	*	*	*			6	67%	$466
OLEGARIO DE LA O AVILA					*			*			2	22%	$0
SERGIO CERDA DIAZ				*	*	*					3	33%	$0

1st Place $ 700

TOTAL ATTENDANCE 52

$ $3,654

SHIFT: SERRANO — Second Place

LUIS JUAREZ ORTIZ	*	*	*	*		*	*	*			7	78%	$435
MARCOS RAMIREZ JUAREZ	*	*	*	*	*	*	*	*	*		9	100%	$560
ALFREDO GUTIERREZ SAAVEDRA	*	*		*	*	*	*	*			7	78%	$435
FAUSTINO PEREZ MEDINA	*	*	*	*	*	*	*	*	*		9	100%	$420
ENRIQUE SERRANO ESTRADA	*	*	*	*	*	*	*	*	*		9	100%	$560
MIGUEL RODRIGUEZ MONJARAZ		*	*	*	*	*	*	*	*		8	89%	$373
JOAQUIN RAMIREZ MOJICA	*	*			*						3	33%	$0
MARTIN AGUILAR MORALES				*		*	*				3	33%	$0
CASIMIRO LUNA ALBA		*	*	*	*	*					5	56%	$233

2nd Place $ 560

TOTAL ATTENDANCE 60

$ $3,016

SHIFT: MOJICA — Third Place

EMILIO OJEDA MARTINEZ	*	*	*	*	*		*				6	67%	$280
J. MANUEL CONTRERAS ALVAREZ	*	*	*	*	*	*	*	*			8	89%	$497
RAUL MARTINEZ VIGIL	*	*	*	*	*	*		*	*		8	89%	$497
J. MERCED ALCALA YAÑEZ		*	*	*	*	*	*	*			7	78%	$326
DANIEL FLORES RAMIREZ	*	*		*	*	*	*				6	67%	$466
JOSE NAVARRO LOMELI				*	*						2	22%	$0
											0	0%	$0

3rd Place $ 420

TOTAL ATTENDANCE 74

$ $3,652

CRITERIA: THE BUDGET FOR THE GROUP THAT IS IN EACH PLACE, MULTIPLIED BY % ATTENDANCE AT FEEDBACK MEETINGS. TO OBTAIN A PRIZE AT LEAST 50% OF MEETINGS MUST BE ATTENDED.

7th SYMAPRO-ILO National Meeting **Guadalajara Bellavista Sugar Refinery**

OPERATIONAL MANAGEMENT COMPONENT

How does an organization start SYMAPRO management?

For the SYMAPRO to function and to generate impacts, various functional and hierarchical levels in the organization must be involved.

OPERATIONAL MANAGEMENT
FUNCTIONS IN THE MANAGEMENT OF THE MODEL
• Corporative General Management • Corporative Human Resources Management • General Management • Operational and Administrative Management • Middle Management • Industrial Relations / Human Resources • Union • Workers • SYMAPRO Coordination • External Consultancy

The first level that has to be involved is the **general management** of the organization. Preferably it should lead the SYMAPRO project with a strategic perspective. Thanks to its position it can coordinate the SYMAPRO with the organization's objectives in a global way and relate it to the organization's technological and organisational innovation projects. In the final analysis, it is general management that evaluates the impacts of the model and allocates the resources needed to set it in motion and maintain it in operation. It is also this level that decides whether the SYMAPRO will remain as a project or be absorbed into organization policy.

It is recommended, in the light of the above, that management of the SYMAPRO should begin with senior management in the organization. At this level the general objectives and the way the project will work are agreed, resources allocated, and people appointed to be responsible for putting it into operation. These responsibilities include coordinating the project and the role that middle management shall play in the model (preparing and directing feedback meetings, measurement).

Another aspect agreed at the top level is the trajectory of application, in other words which departments or areas the model will start in and how and to what other areas the learning system will be extended.

Usually a brief description of the project with objectives and implantation stages is prepared. This project description is submitted to senior management for consideration, revision and approval. During implantation, reports are submitted in function of the overall scheme to serve as a basis for follow-up and decision-making.

EXAMPLE: DESCRIPTION OF SYMAPRO IMPLANTATION IN AN ENTERPRISE

PROJECT
SYSTEM OF MEASUREMENT AND IMPROVEMENT FOR PRODUCTIVITY
'SYMAPRO'

The proposal to implant the Symapro consists of the following stages:
a) start, b) extension, c) maintenance.

a) Start:

- Define one or more areas of the sugar refinery where the Symapro will start.
- Hold a workshop with workers and supervisors in these areas to visualise problems and solutions.
- Define the measurement indicators and parameters (workshop to define indicators with workers, supervisors and supervision personnel).
- Design and install forms and data processing resources.

b) Extension:

- Evaluate the results of the pilot experience and make the necessary corrections.
- Extend the Symapro to all areas, in each case holding workshops to visualise and define indicators and measurement parameters.
- Apply the Symapro to the processing period.

c) Maintenance:

- Keep the Symapro meaningful in the enterprise by updating and innovating indicators, forms and the follow-up model for feedback meetings.
- Link the Symapro to training and labour skills evaluation.
- Define the new supervisor profile that supports the Symapro, the quality systems and holistic maintenance.
- Train supervisors in quality systems, total production maintenance, and the training and skills-based evaluation of workers.

The start phase begins with the following activities:

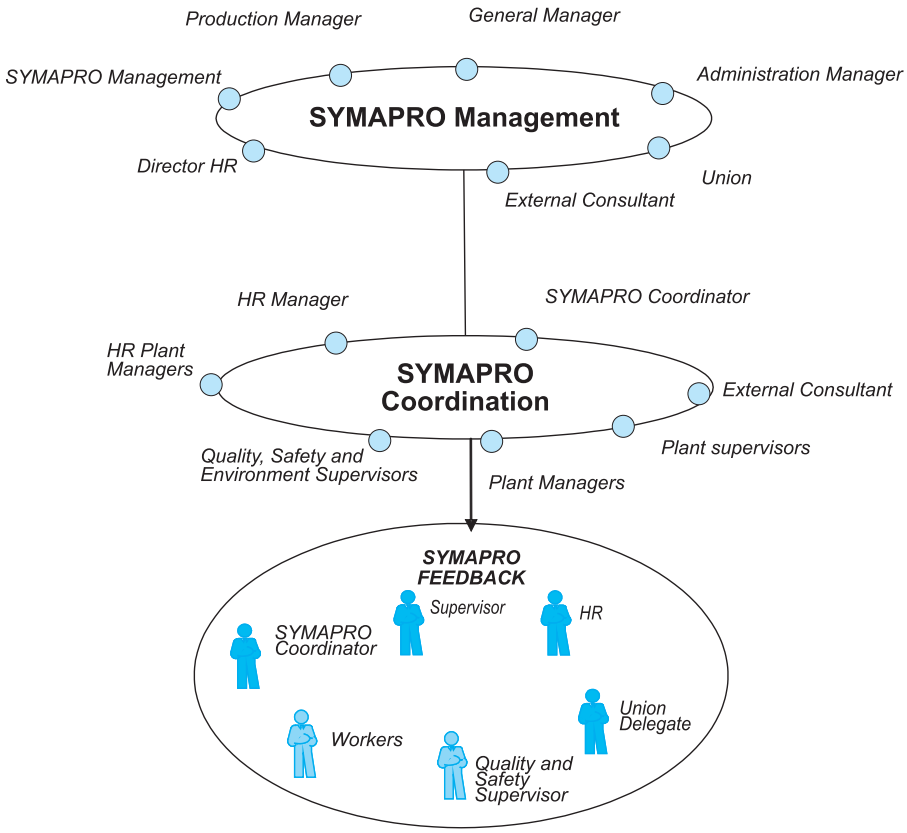
1. Define with senior management the objectives and expected results of the Symapro.
2. Explain the principles of the system to middle management, and also their role in managing the system.
3. Explain the objectives and principles of the system to the union.
4. Identify the areas when the Symapro will start.
5. Establish the functions and work plan of the Symapro coordinator.
6. Plan the visualisation and measurement definition workshops.
7. Ensure availability of the necessary infrastructure (computer, meeting rooms, transport if necessary).
8. Set a provisional starting date for measuring and set the feedback meetings schedule.
9. Define the elements to promote the Symapro (T shits, notice boards, invitations, leaflets).
10. Establish the budgetary allocation.

The following activities will be needed for follow-up on the start process.

The management of the SYMAPRO is dynamic and involves constant adaptation and continual improvement. In this context the "start" is repeated over time, so senior management has to repeatedly review and evaluate the process and put new cycles of the SYMAPRO into operation. There are also times when senior management will intervene during a cycle, for example when decisions have to be made about a specific proposal that emerges from the SYMAPRO and which requires resources to be allocated or a change in procedures or policies.

The manager of the **human resources department** (HR) is usually in charge of leading the SYMAPRO project in the organization. This is the person responsible for formulating the SYMAPRO implantation strategy. He is in close contact with senior management to ensure that the project is aligned with the organization's global objectives and to provide feedback about decisions that have to be taken. He also has to involve middle management, the union and the work teams in the operational management of the project. He will work with the SYMAPRO external consultant to reinforce and renew the implantation strategy. He is also responsible for planning and ensuring operational aspects as regards infrastructure (rooms, media), communications (invitations, induction), resources (food, prizes), times (middle management and management time allocations), community and external institutions (for example, support for the training capsules).

EXAMPLE OF SYMAPRO FUNCTIONAL ORGANIZATION



General management, operational management and administration management have to give considerable guidance to the SYMAPRO process and exercise control over its content. They are the tactical core of the SYMAPRO. They have the task of defining how the SYMAPRO is to be implanted in the various departments or areas. They play a key role in the implantation process because it is they who must use the SYMAPRO as a tool for productivity and personnel management. Their function is to link the SYMAPRO to the objectives and goals in the various areas, and to ensure that the indicators in the system are congruent and converge to meet those objectives. Their task is to set the parameters of action for the coordinator and for middle management staff as regards which indicators to use and what anchor points to set (100, 0 and -100) to give measurements a rating on the effectiveness scale. Then they have to validate the proposed indicators and anchor values that emerge from the consultation process with middle managers and workers. They take part in some feedback meetings but not all because they have other tasks to attend to. They receive the improvement proposals from the feedback sessions, analyse and discuss them with middle management and the SYMAPRO coordinator, and if a proposal is approved they take decisions about what support to provide for implementation. They maintain close contact with the SYMAPRO coordinator to keep the system focalised on aspects that are critical for the operation, and provide support so the various components are suitably implemented.

The management of the SYMAPRO usually begins at these administrative and management levels. First a proposal is drawn up with objectives, implementation stages and expected results. This is presented at a meeting with representatives from this level, who are also given a brief outline of the SYMAPRO model. Agreement is reached on the objectives to be measured and the indicators to be used, and these will subsequently be analysed with other actors in the process. It is important to make explicit the precise role each manager at this level will have to play in the implementation process, and to define the functions involved.

TYPICAL PATH TO START SYMAPRO MANAGEMENT

1. Prepare the proposal.
2. Make a presentation to management and the union.
3. Hold a middle management induction workshop.
4. Hold a problems and solutions visualisation workshop with workers and middle management.
5. Train the SYMAPRO coordinator.
6. Join a learning network about SYMAPRO management through an external consultant.

The **union** or workers' representation is another actor who supplements the group putting the SYMAPRO into operation. Depending on the organization's culture, union representatives take part in the initial meeting with management (or perhaps attend a secondary meeting later). At this meeting the social

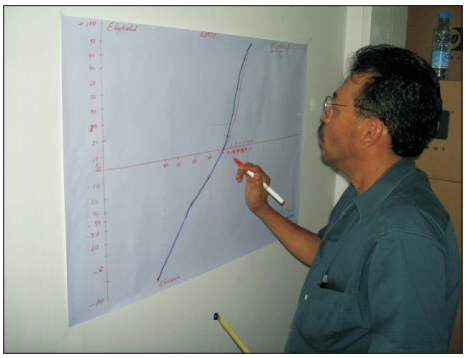
indicators are emphasised. These are what make the productivity measurement and improvement system holistic and integrated. The union may play an active or a passive role, depending on its culture and habitual stance in the organization. It is recommended that the union should be involved in the management of the SYMAPRO so as to establish a platform for dialogue that may help make the project more sustainable. The implantation of the SYMAPRO means changes in the culture of how work is organized, and union participation is needed for this process to proceed in a balanced way. The union's function is to validate the SYMAPRO as a whole, especially with regard to managing the feedback meetings and motivating the workers involved in the process. The union should also validate the improvements made in the realm of working conditions (decent work). For example, the invitations for the workers to take part in the various components of the SYMAPRO are usually issued jointly by the enterprise and the union. At the end of each cycle, the union verifies the improvements made in working conditions and communicates this to the main body of workers.

Middle management (supervisors and/or shift foremen) play a key role in managing the SYMAPRO. In the changeover to a permanent learning and inclusive culture in the organization, it is middle management whose function changes first. The changeover is from a unidirectional management structure to a system that includes reflection, analysis and commitments based on knowledge dialogue. It is very common for there to be resistance to this change, and there are various reasons for this. Some resistance is caused by the changes in the style and content of leadership that the SYMAPRO involves, the orientation more to facilitation, feedback and group learning. In other cases, there is insufficient and/or inconsistent support from management, which sends contradictory signals. In both of these scenarios the situation may be aggravated if the preparatory groundwork as regards SYMAPRO methodology was insufficient. But this factor can be controlled within the SYMAPRO management system, which is why it is essential to hold a workshop to introduce middle management to the SYMAPRO methodology as part of the initial implantation of the system. At this workshop the methodology is presented step by step and the role middle management must play is made explicit. This role includes supporting the daily or weekly measuring and information processing process, preparing the feedback meetings with priority aspects, preparing the training capsule, leading the meeting, and collaborating on the implementation of improvement proposals. This changes the traditional function of the foreman or team boss into a facilitating role to support effective learning among the collaborators.

There are opposing opinions and positions about the role that unions should play in the SYMAPRO. In some organization cultures an effort is made to minimise their participation, while in others they are seen as a resource that can lend support to the process. An example of the latter position is an enterprise that wanted to interrupt the SYMAPRO process because management lacked discipline and perseverance. The union opposed this, arguing that the SYMAPRO was a declared policy of the organization and that therefore a commitment was involved. The SYMAPRO was continued in the enterprise thanks to this union intervention.

The scope and depth of SYMAPRO implantation in the organization depends to a large extent on assimilating middle management into the system. It has been found in practice that when they come to see it as a management tool in their areas of work, the system progresses and has the impact expected. But if this is not the case, the system usually depends on the coordinator and does not have a sustained or significant impact. For this reason, middle management should be trained and constantly guided as to how they manage the SYMAPRO system.

The **workers** are the mainstay of the SYMAPRO. If they did not take part in the feedback meetings there would be no SYMAPRO. The workers are involved from the very start in constructing the indicators and measurement values. Therefore they have to be trained in the principles of the SYMAPRO and in the role they will play in the system. This includes collaborating in measurement, reflection, generating improvement proposals and verification procedures. A lot of what is involved and what it means will be learned in practice, when the process is actually in operation. However, at the start there has to be a consensus of opinion about the relevance of the SYMAPRO for the staff, and an agreement about the commitments involved. A workshop about the SYMAPRO can be held to provide initial training for the workers, to introduce them to the visualisation of problems and solutions, and middle management and even senior managers should be present. The aim is to establish communication between the different functional and hierarchical levels of the organization about objectives and the measuring system.



SYMAPRO workshop for middle management

The workshop consists of two stages. First there is an exercise in which the participants are asked to do a drawing of the work they do in the organization (including the place and the means), and then they do a second drawing depicting ways to improve their work environment and way of working. These drawings are analysed in a cross system whereby one person's drawing is commented on by somebody else and vice versa, and thus "bridges" are built between the participants' mental models and proposed changes. This analysis of the drawings

The drawing about work the person in the visualization workshop is doing is significant for two reasons:

1. It makes communication possible between people with different levels of training since the capacity to draw is not connected to a person's level in the organization.
2. It invites reflection about work in a situation in which an individual cannot communicate all he wants to say about the subject in question.

Both aspects facilitate subsequent focalisation of the discussion on objects and the indicators used for measuring.

gives rise to proposals that are registered on the follow-up form, which enables the participants to have an image of what will later be implemented systematically.

The second stage in the workshop consists of an analysis of general objectives, specific objectives in various areas, indicators to measure effects and the information processing system. This phase is more technical and it is partly supported by the first, visualisation stage. Critical points that emerged in the first phase are re-examined and put into perspective in the light of the objectives and measurement indicators. It is probably not possible for the participants to understand the SYMAPRO system in all its details just at this one workshop, but they will have a clear grasp of the aims of the system, mainly because they have participated in reflection and communication activities involving staff from different levels of the organization. This usually paves the way for the workers to accept the SYMAPRO, and now it can be put into operation.

EXAMPLE OF THE PRESENTATION
AT A WORKSHOP TO VISUALISE PROBLEMS AND SOLUTIONS

- **Aim:**
  To establish close communication between all workers and middle and senior management in function of:

What is our department or work area like?	How would we like to see it?	What should we do to achieve this?

- **Objective:**
  To detect problems and possible solutions.
- **Development:**
  To make visual representations (images) of something that is not in sight and relate these to quantitative and social aspects that affect the enterprise (work areas).

Graphic visualisation of problems and solutions

How is a SYMAPRO coordinator selected?

In the light of the above description of the SYMAPRO methodology and the roles the different hierarchical and functional levels of the organization play in it, we can derive a profile of the skills the coordinator of the system will need. This is the input for the selection process to fill this post or function.

Filling the post of coordinator does not always involve creating a new company position or contracting additional personnel. SYMAPRO coordination can be grafted onto another function like industrial safety, for example. But the risk in not creating a separate post of SYMAPRO coordinator is that the person selected may become overloaded with a variety of activities, and this could hamper his/her performance in the effort that is needed to ensure the SYMAPRO functions well

The profile of the position of SYMAPRO coordinator includes the mission of the post, the basic activities and functions involved, the results or products expected, the processes this person is involved in, and the technical and social skills needed. These social-personal components are very important in discharging the coordinator function. Many of the technical skills can be learned in a short time but this does not apply to social and personal skills, so these have to be taken into account during the selection process.

This profile, especially the skills needed, is used to draw up a list of candidates and implement a selection process. It also informs the candidates about just what is involved in the position, and this will help them get a clear grasp of how they are expected to perform in the post.

Some personal characteristics the SYMAPRO coordinator must have:

- To be recognised technically and socially by workers and middle management.
- The ability to motivate collaborators.
- The ability to communicate ideas clearly and simply.
- The ability to listen to and harmonise different points of view.
- Organisational ability.
- A disposition to learn from the workers.
- A disposition to learn about the characteristics of work in the organization.

This profile is also a reference point for evaluating the SYMAPRO coordinator's performance, which is linked to the objectives and goals of the programme as a whole. To the extent that the coordinator is able to perform as stipulated in the profile, he or she will be achieving the expected impacts of the SYMAPRO as a programme.

Profile of SYMAPRO Coordinator Position	
RELATED PROCESSES Production Maintenance Quality and Continual Improvement Industrial Safety Labour Relations **SKILLS** Technical SYMAPRO Methodology Costs Administration Statistics Quality Management Group Facilitation Health and Safety at Work Calculation Programmes (spreadsheets) **Social and Personal** Communication Pro-active Negotiator Systematic Geared to Results	**MISSION** To organise the SYMAPRO in the different areas of the organization, drawing support from those responsible for production/operation and human resources, keeping registers updated and visualising indicators and impacts. **BASIC ACTIVITIES** To agree with area personnel and management on the management of measurement indicators for each cycle. To involve middle management and union delegates. To ensure the indicators are measured objectively and systematically. To process the information and present the results clearly in a graph format. To prepare the training capsule for feedback meetings. To co-facilitate feedback meetings and provide follow-up on the commitments made. To ensure the infrastructure needed for the SYMAPRO to develop is available. To create ways to motivate and involve the personnel. To write periodic reports about results and impacts. To constantly make innovations in the application of the SYMAPRO, relating it to skills-based management. **PRODUCTS** To improve the indicators. To execute the proposals that emerge from the feedback meetings To increase participation by workers and middle management. To increase improvement proposals and commitments.

What support and infrastructure does the SYMAPRO require?

The support and infrastructure required depend on the characteristics of the situation in each case, which includes the resources available and the social relations between the actors in production. Nevertheless, we can draw up a list of elements that are recommended in most cases, bearing in mind that the scope of each will vary with specific circumstances. These can be seen as common denominators.

Classification of SYMAPRO support elements
SYMBOLS AND COMMUNICATION SUPPORT
• DISPLAY AND NOTICE BOARDS WITH ADVANCE SYMAPRO INFORMATION • ENTRPRISE AND UNION LOGO • SYMAPRO START AND CLOSE LEAFLET • LETTER OF INVITATION • T SHIRTS, CAPS, PENCILS • PRIZES, RAFFLES
PLANNING INSTRUMENTS
• HUMAN, MATERIAL AND FINANCIAL RESOURCES • FEEDBACK MEETINGS SCHEDULE • TRAINING AND MONITORING

The common elements required can be grouped into two categories. The first are those that support communication, and SYMAPRO provides a set of symbols to make the system visible and recognisable in the organization. The second category consists of physical material support elements and liquid resources (time, budget) which are necessary instruments to be able to plan and manage the SYMAPRO.

What are the symbols and communication support elements?

a. Display windows and notice boards

For the personnel in the organization to know how well their team or group has performed, it is essential to display the results of the daily and weekly measurements and the 'before' and 'after' images showing the outcomes of improvement proposals. This helps not only to maintain motivation but also to provide inputs for analysing and questioning a given situation or measurement, should the need arise. To the extent that concrete results are presented, the visibility and credibility of the system are maintained.

Display windows and notice boards can be used. The display window provides protection against dust so the material presented, which is usually in the form of printed sheets of paper, does not deteriorate. The disadvantage it that it implicitly creates a distance between the viewer (the personnel) and the information as he cannot be in close contact with it.

The display window or notice board requires constant maintenance. If it is not constantly kept up to date or kept tidy it does not discharge its function and it can even cause implicit rejection on the part of the staff.

There should be a display window or notice board for each area and, if possible, a general one too, which has information about all the areas. The display window or notice board will have the lists of measurement results for that week, cumulative lists up to a certain date, the feedback meetings schedule, and information about improvement proposals that are currently being executed. In addition, there can be 'before' and 'after' images showing the outcomes of improvement proposals, announcements about training events, and reminders about work safety measures or the correct way to look after tools.

SYMBOLS AND COMMUNICATION SUPPORT

Display windows and notice boards with SYMAPRO progress information

b) Enterprise and union logos and icons

Logos and icons that represent the SYMAPRO should be designed, and it is important to use them. They help to establish the system as a work culture and make it easy for people to recognise the different expressions of the SYMAPRO. The logo or icon can appear on announcements about feedback meetings, training capsules, measurement results and news bulletins about improvements in each area. For example, the sheets with reports of improvements can be identified with a stamp and the SYMAPRO logo, so personnel will get used to the symbol and associate it with what is happening in their work area.

Just as the logo helps people identify with the SYMAPRO, if the system is not meaningful for them the logo may turn into an element that works against the new culture in the organization as it will come to symbolise something that is essentially meaningless or even something that works against the interests of the staff. In order for the logo to be a meaningful positive symbol it has to be associated with significant positive action, and this connection has to be maintained. The logo will appear in various contexts and in connection with other programmes and activities, and this is an important aspect of maintaining it.

The logo should also be associated with the enterprise and the union. It has to be recognised as something the enterprise and the union are both committed to, so the staff identify it not only with efficiency and quality objectives but also with participation and improvements in working conditions.

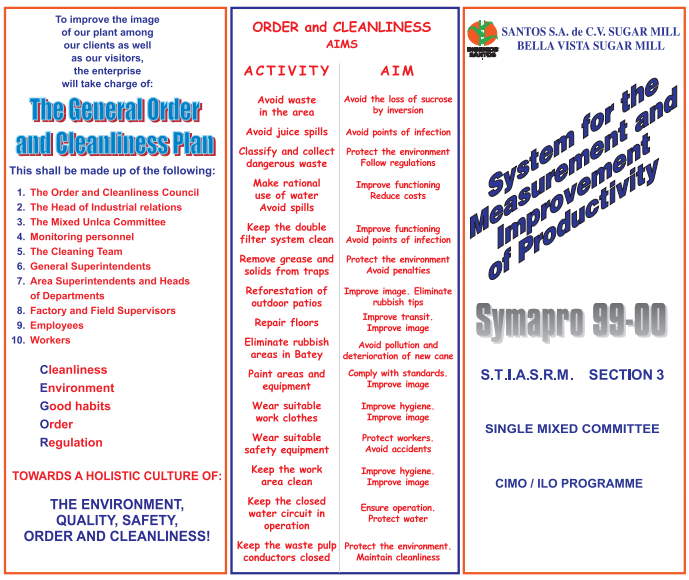
SYMBOLS AND COMMUNICATION SUPPORT

Logo: enterprise and union

c) Leaflets about the SYMAPRO start and cycle completion

Leaflets or other means can be used to make public information about the SYMAPRO programme, to help disseminate the objectives of the measurement and feedback cycle throughout the organization. Leaflets make the system formal, they send the message that it is associated with management and the union and is therefore legitimate, and in addition that the objectives and concerns of the organization as a whole are congruent with the SYMAPRO measurements in the various work areas.

SYMBOLS AND COMMUNICATION SUPPORT



Leaflets about the SYMAPRO start and cycle completion

Very often middle management and operational staff do not know what the main objectives and goals of the next cycle are, and different people will say different things about them. Issuing a leaflet with this information obliges the organization to make an effort to focalise and clarify these objectives and goals, and it keeps the staff informed so as they go about their daily work they will know what is expected of them in terms of performance. The fact that there is a set common reference documents fosters effective communication among the personnel.

When a cycle terminates the organization can issue another leaflet with the results of the SYMAPRO indicators for each area and of the enterprise as a whole, and the areas or teams that achieved the best results can be give special mention. The information about the SYMAPRO indicators and the global enterprise results can be supplemented with data about the number of feedback meetings, the degree of staff participation, the number and types of training capsules and the number of improvement proposals generated and executed. There is usually some information about the best improvement projects and their impacts.

The system is backed by the enterprise and by the workers' representatives, all personnel are involved in defining and validating it, and in the end they all come to support it. This makes the SYMAPRO transparent and gives it credibility, which in turn makes it sustainable over time. The work system is gradually changed into a permanent learning system in the organization.

d) Letter of invitation

At the start all staff can be sent a letter inviting them to participate in the SYMAPRO and in particular to take part in the feedback meetings. In some organization's cultures this is a requirement, and a personalised letter is sent to each employee. This is seen as necessary if they are to respond and participate, especially when their involvement is voluntary. This would be done when the feedback meetings are held at mixed times, partly on the enterprise's time and partly on the workers', or all on the workers' time (for example if the production process is continuous).

In other organizations that already have a strong and deep-rooted communication culture, or in which the system has been implanted and is already mature, it is not necessary to send a personalised letter of invitation; an announcement in the display windows or on notice boards is sufficient.

The letter of invitation should be signed not only by management but also by the union or workers' representative. This sends the message that knowledge dialogue is involved and this is a process of collective and individual learning in which everyone's interests converge. If both parties do not sign, the letter should go out under the signature of the manager or director of the organization.

SYMBOLS AND COMMUNICATION SUPPORT

SIMAPRO 99-00

BELLAVISTA, JALISO, JANUARY 2000.

Dear Mr J. Jesus Martínez Yañez,

We are writing to cordially invite you to the opening of the:

SYSTEM FOR THE MEASUREMENT AND IMPROVEMENT OF PRODUCTIVITY SIMAPRO 99-00

This system has been made possible by the participation of staff who are concerned to improve how this enterprise functions.

The meetings are held in the training classroom in this sugar mill in accordance with the schedule of dates located at the timekeeping point and in each participant's work area.

We hope you will be able to join us because this will enable us to reach the goals we have set.

Yours sincerely

Raul E. Cardeñas Escobar
General Manager

Letter of invitation

When a SYMAPRO measurement cycle has reached its conclusion, all personnel are sent a letter of invitation to announce the general assembly and prize giving ceremony. This formal approach involving the image of the system can be very significant. In many organizations it is rare for management to address the staff in a formal way, and even rarer when it comes to operational workers. A communication of this kind at the start and at the end of a cycle contributes to institutionalising the system as it projects the image of a systematic effort. But, as always, there is the risk that it could become a meaningless event that is just one more bureaucratic procedure.

SIMAPRO
2004 HARVEST

ZUCARMEX

ZUCARMEX

CIA. AZUCARERA LA FE, S.A. DE C.V.
PUJILTIC SUGAR MILL

SIMAPRO

We are writing to cordially invite you to join us at the:

FEEDBACK MEETING

PRODUCTION DEPARTMENT

2004 HARVEST

Our aim is the continual improvement of work and working conditions for all workers who are part of the ZUCARMEX group.

This meeting will be held on FRIDAY 25 September at 13.00.

Location: Training Centre

GERARDO HERNANDEZ CARDENAZ

JOAQUIN DOMINGUEZ VAZQUEZ

e) T shirts, caps, pencils, etc

Again, the use of these promotional items varies depending on the kind of organization in question. They are usually employed as an incentive to motivate staff to attend feedback meetings, or as part of a promotional campaign. For example, in the first feedback meeting the participants are given a T shirt or cap with the SYMAPRO slogan for the current measurement and improvement cycle. This is a way of raising awareness that something new is starting and its success depends on everyone participating and becoming involved.

SYMBOLS AND COMMUNICATION SUPPORT

As part of the campaign, the SYMAPRO name and/or logo can be put on people's uniforms or safety helmets, to maintain awareness that this is a continual learning process involving innovative action geared to improving productivity.

The purpose behind the use of these items is to foster the idea of belonging to a shared group programme or project. This works provided that participation in the programme is meaningful and/or a source of pride. Therefore the system as a whole has to be congruent and consistent, otherwise it is just expenditure with no real return, or it can even become counter-productive.

f) Prizes, raffles and other incentives

In the SYMAPRO system, incentives are based on two elements, but these may converge and become just one. The first is achieving a result, and this has a number of aspects. Rewards could be based on the final result of the SYMAPRO measurement indicators, participation at the feedback meetings, or some other

Cia. Azucarera del Ingenio Bellavista, S.A. de C.V.
Attendance - Prizes
Concentrado Asistencias-Premio SYMAPRO 99-00
BATEY - MOLINOS

NAME	20-January-00	04-February-00	14-February-00	03-March-00	17-March-00	31-March-00	15-April-00	05-May-00	19-May-00	Attendance	% Attendance	% Absence	$	
SHIFT: Villegas														
AMEZCUA RIOS BLAS										0	0.00%	100.00%	$0.00	
INFANTE STA ROSA CRESCENCIO										0	0.00%	100.00%	$0.00	
PACIO VILLANUEVA GREGORIO	X									1	11.11%	88.89%	$83.33	1 st. place
DE LA O WENDEZ MARTIN	X									1	11.11%	88.89%	$83.33	100 %
CONTRERAS MARTINEZ J. JESUS	X		X		X					4	44.44%	55.56%	$333.33	
LOZANO GARCIA SALVADOR										0	0.00%	100.00%	$0.00	
VILLEGAS RODRIGUEZ LUIS		X		X		X				3	33.33%	66.67%	$250.00	
AVILA JUAREZ JAVIER	X		X		X					6	66.67%	33.33%	$500.00	
MARTINEZ DIAZ J. JESUS		X								1	11.11%	88.89%	$83.33	
VARGAS LUNA ANTONIO	X		X		X					6	66.67%	33.33%	$500.00	
RODRIGUEZ AVILA ANTONIO										0	0.00%	100.00%	$0.00	
CADENA LEPE JOSE LUIS	X				X					3	33.33%	66.67%	$250.00	
SANTENO RODRIGUEZ JOSE										0	0.00%	100.00%	$0.00	
Subtotal Shift										25	*26.67%*	*73.33%*	*$2.083.33*	
SHIFT: Martinez														
SANTENO HERNANDEZ PABLO	X				X		X			3	33.33%	66.67%	$200.00	
VAZQUEZ JAUREGUI ABRAHAM			X				X			2	22.22%	77.78%	$133.33	
ALCALA YANEZ J. JESUS	X									1	11.11%	88.89%	$66.67	2 nd. place
VAZQUEZ JAUREGUI PEDRO	X				X		X			3	33.33%	66.67%	$200.00	80 %
SALAZAR NORIEGA JOSE					X					1	11.11%	88.89%	$66.67	
ALVAREZ INFANTE MARYIN	X		X		X		X			6	66.67%	33.33%	$400.00	
MARTINEZ TORRES J. JESUS	X		X				X			3	33.33%	66.67%	$200.00	
ANDRADE VAZQUEZ MIGUEL										0	0.00%	100.00%	$0.00	
PRADO CUARENTA J. CRUZ	X		X		X		X			6	66.67%	33.33%	$400.00	
CARRASCO VALADEZ ANTONINO	X		X		X		X			6	66.67%	33.33%	$400.00	
Subtotal Turno										31	*34.44%*	*65.56%*	*$1.866.67*	
SHIFT : Rios														
RAMOS LEAL LUIS	X				X		X			3	33.33%	66.67%	$150.00	
VILLANUEVA LEAL RIGOBERTO					X					1	11.11%	88.89%	$50.00	
AGUILAR SANTENO JUAN					X					1	11.11%	88.89%	$50.00	3 rd. place
MORENO AGUILAR DAVID			X		X		X			3	33.33%	66.67%	$150.00	60 %
RAMIREZ ALVARADO ANTONIO					X		X			2	22.22%	77.78%	$100.00	
RIOS SANTA ROSA J. JESUS	X		X		X		X			5	55.56%	44.44%	$250.00	
ORTIZ HERNANDEZ PABLO	X	X	X		X		X			6	66.67%	33.33%	$300.00	
ROJAS ESPARZA VICENTE	X	X	X		X		X			6	66.67%	33.33%	$300.00	
DIAZ VIGIL ANGEL	X	X	X		X		X			6	66.67%	33.33%	$300.00	
ACEVES RODRIGUEZ PABLO	X				X		X			4	44.44%	55.56%	$200.00	
TOSCANO LUNA SALVADOR	X	X					X			3	33.33%	66.67%	$150.00	
RODRIGUEZ RUIZ EDUARDO										0	0.00%	100.00%	$0.00	
TORRES LOPEZ FRANCISCO										0	0.00%	100.00%	$0.00	
Subtotal Shift										40	*38.89%*	*61.11%*	*$1.850.00*	
Total Departament										96	27,8%	66,7%	$5.800,00	

CRITERIA: The budget for the group that is in each place multiplied by % attendance at feedback meetings.

Photograph of bicycle raffle.

criteria. If the incentive system is made more complex it can also be the basis for a prize for the number of improvement proposals executed and the impacts these have on productivity (and costs). There can be a scale in function of selected variables and a system of prizes and/or benefits that depends on the number or quantity of saving and/or other kinds of progress that has been generated (for example, response time, client satisfaction).

Another criterion for establishing incentives is the time that personnel dedicate to the system. This would be used in particular when the feedback meetings take place on the workers' own time, outside working hours. Normal hourly pay should be taken into consideration when time dedicated to the SYMAPRO is assessed. This is not a question of paying staff to attend the feedback sessions but rather a matter of giving rewards in function of qualitative results in the realm of better communication and improved interpersonal relations. The extent to which these aspects improve can be taken into consideration when calculating payments based on attendance levels.

For example, in a situation in which it is difficult to precisely quantify the results of the SYMAPRO but in which there are qualitative benefits, the criterion for incentive payments could be linked to standard hourly pay for the number of hours a member of staff dedicates to the system by attending feedback meetings. This would involve a proportion of total pay per hour, calculated using a coefficient that reflects SYMAPRO results in effectiveness points and number of feedback session hours. The advantage of this approach is that the total monetary amount of incentive payments would remain under the control of cost parameter criteria.

The motivation provided by the incentives system may become ineffective because the monetary rewards are small or just because there is no variety in the system. Another possibility is that the organization may wish to reward some particular effort that is reflected in the results of specific indicators. Take for example a work team that did not achieve the best total effectiveness results in the SYMAPRO system but did emerge with the best result on one partial indicator, risk and accident prevention for example. In this case an option would be to award the team a prize or incentive, but instead of each team member receiving a small payment, they would all take part in a raffle with substantial prizes. Again, this depends on the organization's culture and the labour relations situation.

Planning instruments

The inputs or instruments needed to effectively plan SYMAPRO management have been classified into (a) human, material and financial resources, (b) the schedule for the feedback meetings, and (c) training for middle management and process monitoring.

a) Human, material and financial resources

The basic human resources need to implant the SYMAPRO are a coordinator and, depending on the size of the organization, perhaps an assistant or trainee on release from a technical training institution. It is better if the post of coordinator is a full time job so this person can guide and deepen the learning processes involved in the SYMAPRO, but if this is not feasible or not justified because the organization is small, it may be a part time job.

The minimum material resources needed include a space where the feedback meetings can be held. The SYMAPRO coordinator must have an office with a computer, a printer, and if possible a projector for measurement result presentations for work teams. A digital camera is also useful as a training support tool to generate visual inputs. Stationary is needed, and didactic support materials for the feedback meetings and training capsules. There should be display windows or notice boards in various areas where information about progress in the SYMAPRO can be made public. Various kinds of promotional material are needed so staff in the organization are always conscious that the SYMAPRO is in operation.

The financial resources consist of SYMAPRO running expenses, and the human and material resources also require expenditure or a budgetary allocation. These running expenses include soft drinks and snacks at the feedback sessions, the food and organization costs of the general assemblies at the end of each SYMAPRO cycle, the prizes awarded in each cycle, external consultants' fees, and the cost of specialised training for eternal agents.

PLANNING INSTRUMENTS		
HUMAN	**MATERIAL**	**FINANCIAL**
SYMAPRO coordinator	**Meeting room** **Office** **Computer, printer** **Digital camera** **Stationary** **Display windows, notice boards** **Promotional material**	**Soft drinks** **Feedback meetings** **End of cycle general assemblies** **Prizes** **Consultants** **Training**
Human, material and financial resources		

b) Schedule for feedback meetings

A practical tool in SYMAPRO planning is the schedule for feedback meetings. This is a way of setting up the framework for a systematic, ongoing learning task. It is usually quite difficult to systematically implement training activities in organizations, and there are two reasons for this. First, organization cultures are usually more geared to reacting to events than to anticipating them or taking preventive measures, and second, organizations do not usually assign high priority to training efforts. Therefore it is essential to have a schedule for SYMAPRO activities, and to comply with the schedule in order to establish a routine.

As in all planning, there has to be flexibility to be able to handle unforeseen events, and this applies to the meetings schedule. Sometimes a meeting will have to be suspended or re-scheduled because of an emergency or lack of time or space, and the big danger here is that re-scheduling might become the rule rather than the exception, and the systematic rhythm will be lost. This does not mean that feedback meetings cannot be planned in different ways. At one extreme, the date could be left open and everyone will know the meeting will be held at some time in a fixed period, within the next two weeks, for example.

PLANNING INSTRUMENTS

SCHEDULE FOR FEEDBACK MEETINGS

BATEY Y MOLINOS

FECHA	DIA	TURNO VILLEGAS	TURNO MARTINEZ	TURNO RIOS
20-ene-00	Jue	10:00 HRS	14:00 HRS	12:00 HRS
04-feb-00	Vie	12:00 HRS	10:00 HRS	14:00 HRS
14-feb-00	Lun	10:00 HRS	14:00 HRS	12:00 HRS
02-mar-00	Jue	10:00 HRS	14:00 HRS	12:00 HRS
17-mar-00	Vie	12:00 HRS	10:00 HRS	14:00 HRS
31-mar-00	Vie	10:00 HRS	14:00 HRS	12:00 HRS
13-abr-00	Jue	10:00 HRS	14:00 HRS	12:00 HRS
05-may-00	Lun	12:00 HRS	10:00 HRS	14:00 HRS
18-may-00	Jue	12:00 HRS	10:00 HRS	14:00 HRS
29-may-00	Lun	10:00 HRS	14:00 HRS	12:00 HRS

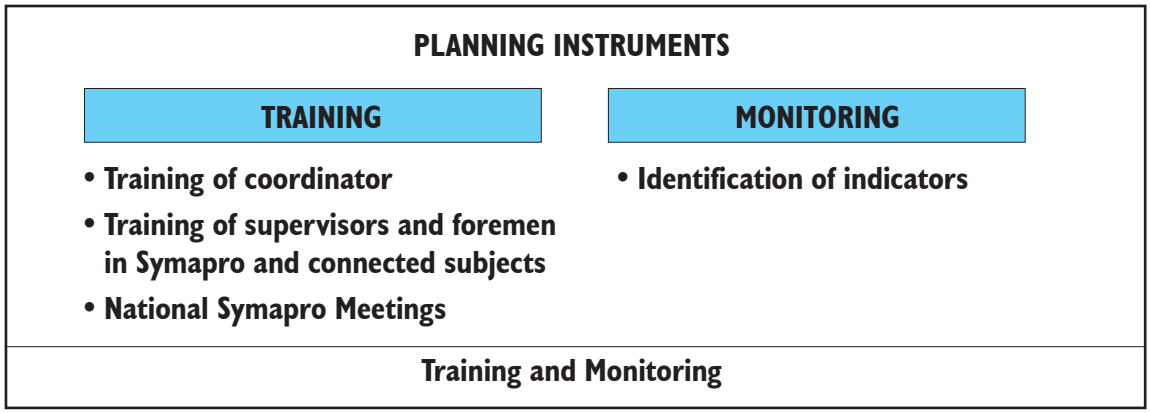
SYMAPRO 99-00 | ING. RENE SANDOVAL CASTELAN, Supte. Gral. de Fca. | INGENIO BELLAVISTA

Schedule for Feedback Meetings

c) Training and monitoring

A key element in the SYMAPRO system is training the coordinator. This individual can be trained formally on a workshop course, or informally on a guided secondment at an enterprise that already has the SYMAPRO installed, or through guidance from an external consultant. This training is one of the first steps when installing the SYMAPRO management system because the quality of the technical aspects of the system depends on it. The social and political management of the SYMAPRO depends on the coordinator establishing links with hierarchical positions in the organization above his/her level.

Perhaps the most crucial element for the SYMAPRO management system to generate positive impacts is the training of middle managers. These are the people who are in day to day interaction with operational workers in routine and learning processes. The SYMAPRO system is geared to learning through continual improvement initiatives that middle managers and operational staff put into practice. The middle manager has to become a facilitator of learning for the people in his area or team, a trainer who helps and guides them so they can reach the set objectives, and these skills cannot be learned just by attending a training course in SYMAPRO methodology. That is a necessary condition, but not by itself sufficient. What is also needed is for middle managers to be guided into their new role as facilitators, and to be trained and oriented in organizational systems that are coordinated with the SYMAPRO but have other dimensions or scope, like for example planning by objectives, ISO quality systems, total production maintenance, and industrial safety systems.



Examples of Networks

A SYMAPRO network has been in operation since 2001 in the sugar industry in Mexico, and enterprises use it to share experiences in the management of the system. By the end of 2008 fourteen national meetings to share experiences had been held, including one in Guatemala and in Dominican Republic. Apart from sharing experiences in managing the SYMAPRO, each meeting has a main theme that its content is focused on. In the eight meetings the main themes were as follows: modernisation in labour relations, skills-based training, multi-skill and multi-function, health and safety at work, ISO systems and coaching, working in teams, social dialogue and impacts.

Network meetings in the tourism sector started in 2008 in Mexico, with a half year frequency.

In the Dominican Republic, the National Institute of Vocational Training (INFOTEP) has organised national productivity seminars which included SYMAPRO experiences from the mid 1990s. Meetings are held every year. There are also regional meetings to share experiences with enterprises that have the SYMAPRO system.

In Cuba, the Ministry of Sugar has organised yearly seminars on human capital development since 2002-03, focused on the experiences with SYMAPRO in the sugar mills.

In Chile, the training institution of the fresh fruit export sector (Agrocap) organised the first network meeting with enterprises, unions and training bodies of the sector in 2009.

This ongoing training for middle management has to be planned as part of the management of the SYMAPRO, not only in its formal and informal dimensions but also as regards evaluating these people's ability to play the role of learning facilitators and to implement improvement proposals jointly with operational workers.

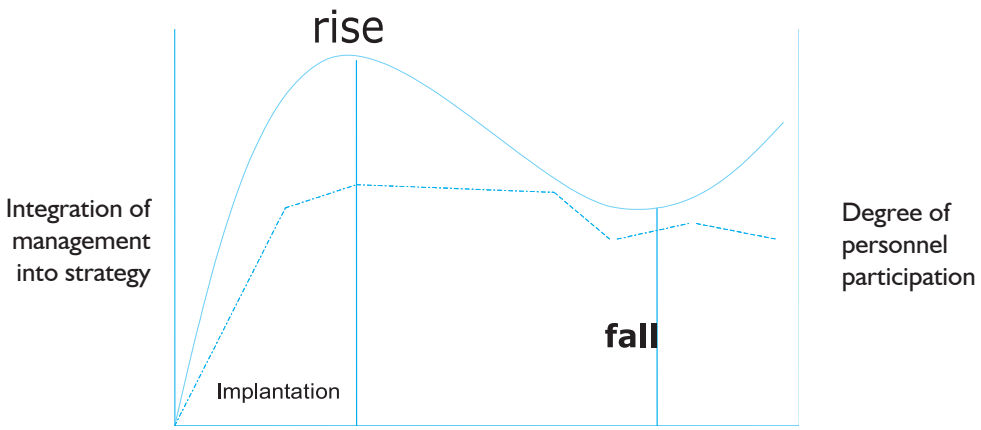
A third key training activity in SYMAPRO management is participation in learning networks at the sector, national and international levels. These networks make it possible to learn from presenting experiences and comparing and contrasting these with experiences in other organizations, and also reflection about the inclusion of new subjects or dimensions in the management of the SYMAPRO. These networks can involve periodic meetings with organizations that have experience with the SYMAPRO (every six months or every year), and also participation in electronic networks via the Internet.

Two aspects in particular have to be taken into consideration when planning training about aspects of SYMAPRO management at the sector level. The first involves planning the time and resources needed to be able to take part in these real and virtual meetings, and the second is taking responsibility on behalf of the organization for some of these meetings, as the participants of the network usually take turns to play host.

An evaluation of SYMAPRO management in its totality involves defining indicators that measure the system's impact. This process should be initiated from the very beginning of the SYMAPRO start stage, although they may be changed later on. These indicators are part of SYMAPRO management because they show whether the system is taking the right path or if adjustments have to be made. The system of macro-indicators that guide the SYMAPRO could be based on productive processes (efficiency, quality, response time, costs), on the labour context (labour climate, absenteeism, accidents) or on both.

What is the 'typical' trajectory of SYMAPRO management?

Usually the application of the SYMAPRO follows a trajectory that is characterised by rises and falls in staff participation and in rate of integration into the organization's global strategy. A key factor in employing the model is the ability to recognise, and as far as possible anticipate, these rise and fall cycles, and take suitable decisions that extend the SYMAPRO in the organization when it is on a rise, and retrench and maintain it when a fall comes.



Typical cyclical rise and fall trajectory in SYMAPRO implementation.

In addition, from the perspective of how the model operates, we can distinguish four stages in the trajectory of SYMAPRO management. These stages correspond to the organization's ability to learn how to adopt the SYMAPRO and adapt it to the organization's own specific idiosyncrasies.

Each of these stages has its own complexities and problems, and the organization has to resolve these if the system is to progress. This process of resolving the complexities involved in implanting the SYMAPRO is an organizational learning process that follows a typical trajectory.

MANAGEMENT TRAJECTORIES

TYPICAL PATH	CRITICAL ASPECTS
• Start	• Obtain support of actors and define coordination
• Consolidation	• Train coordination, design forms, routines
• Maturity	• Improve routines, forms and group dynamics
• Renewal	• Periodically introduce new indicators, deepen training, extend to other tools

There are critical aspects in each stage which are common in the learning trajectories of organizations when they start implementing the SYMAPRO, and there are others that depend on the particular characteristics of each organization. There are no pre-established prescriptions as to how to resolve these critical common and particular aspects. During the implementation process they have to be tackled with a systematic trial and error approach.

The concept of a 'trajectory' has various decision dimensions: direction, velocity, problem solving, progress and slipping back. These dimensions appear continually in the decisions that have to be taken in the implementation of SYMAPRO management. It is helpful to be conscious of these aspects of the trajectory because this clarifies decision-making and contributes to being able to construct a project that is congruent and consistent.

Never forget that implementing the SYMAPRO is a permanent process.

When you install the SYMAPRO it is here to stay!

First stage: The Start

The first stage is the SYMAPRO start. This is of paramount importance as it is necessary to attract the support of the main actors in the organization. The way the system will be coordinated with the organizational structure has to be defined, and it is important to select the right kind of person to be the coordinator. Another key step is to define the scope of the implantation of the system. Very often an organization will decide to start implantation in an area or department that has problems and where the new system can help to resolve them. This is a valid strategy, above all when the problems are rooted in communication and the coordination of functions and tasks.

It is theoretically possible to initiate implantation of the SYMAPRO in all areas and departments of an organization at the same time, but experiences in which this has been tried have not prospered. It is recommended that implementation should begin in just some areas, and the system can be consolidated there before being extended to other areas. This allows the organization to adapt to the system and for the system to be adapted to the organization.

As well as deciding on the areas or departments where implantation will start, there is also the decision about who will coordinate the feedback meetings in the initial phase. Usually the SYMAPRO coordinator takes on the role of facilitator in these first sessions. There are two aspects to this: the facilitator not only has to facilitate feedback about measurements and commitments, but also train heads of departments so they can take on this task as soon as possible.

Second stage: Consolidation

The second stage in the implantation of the SYMAPRO is consolidation. The organization initiates this stage when it has a trained coordinator who is able to exercise the skills and carry out the functions required, and resolve the problems that implantation involves. This means taking charge of the design and use of measurement and feedback forms, processing this information electronically, and setting up the routines that are part of the measurement cycle. This last task includes defining the indicators and their respective parameters in a participative way, handling the measurement procedures and information processing, organizing and providing follow-up on the feedback meetings, and planning the start and end of each cycle.

In addition, consolidation means that middle management will take charge of some key functions in the system, especially taking measurements, processing the results, and facilitating feedback and follow-up.

In this stage it is the middle managers that facilitate the feedback sessions, with help from the coordinator. In fact, the coordinator now moves on to a support role, and takes charge of verifying the quality of the process. In the consolidation stage the SYMAPRO is extended to other areas that were not included at the start. In some organizations it is extended first to production or operational areas and later to support departments (administration, purchasing, sales, human resources), and then it is even extended to suppliers and/or sales distribution channels.

Third stage: Maturity

The maturity stage is reached when the system is functioning with the measurement, processing, feedback and follow-up routines that were established. It has been extended to most of the operational areas in the organization, and middle management, operational workers and senior management are all involved. Middle managers are facilitating the feedback meetings so improvement proposals are being systematically generated, and the implementation of these is being followed up.

In the maturity stage the system functions in accordance with the routines that were designed and set up at the start of the installation process. It is of vital importance to keep tuning the routines and forms to make them more relevant to the real situation, and measurement systems are changed to make them more precise or better suited to enabling the staff to have a real effect. Measuring is also modified in function of the results of the organization's global indicators.

For example, in an enterprise the order and cleanliness indictor was previously measured by shift supervisors, and it turned out that all the shifts always achieved a result of 100 points. The way measurements were taken was reviewed and it was found that a very undemanding criterion was being used to gauge cleanliness. Therefore the system was modified to make measurement more objective, and a person who was not from the area in question was appointed to the task, like an internal auditor. This corrected the problem of measuring the indicator.

At the feedback meetings the training capsules take reflection to a deeper level, and new dynamics are introduced to avoid monotony. Examples of this are adopting a more rigorous approach to identifying the root cause of a problem, or checking and analysing a piece of equipment or a control system so that operational workers will know more about it than what they learn through routine operations.

The ways in which senior and middle management and operational staff participate is reviewed, and adjustments are made. It is often the case that some areas or people are more involved than others in the SYMAPRO. This is frequently in function of the scheduling of the feedback meetings, or it can be due to apathy because people do not see that proposals are implemented or because they are not sufficiently motivated or convinced about the virtues of the system. Therefore, in this stage, the reasons why these people or groups are participating less should be examined, and corrective action taken.

Fourth stage: Renewal

The maturity stage comes to an end when the measurement instruments, data processing, reflection dynamics at the feedback meetings, follow-up on improvement proposals, participation of staff from different levels, general assemblies at the end of the cycles and the prize-giving system are all working well. The organization has incorporated the SYMAPRO and the model has been adjusted to the conditions of the organization. The result is a robust system in full operation.

It is not easy to make SYMAPRO practices routine in an organization, and when this point is reached the system has become organizational culture. The important question is whether the SYMAPRO has succeeded in changing the organization's culture of if has merely been absorbed into that culture, which would dilute its capacity to generate significant learning. In practice, both things happen, and the balance tilts more towards one side or the other as the case may be.

"The SYMAPRO must not be allowed to become routine!" With this slogan, an enterprise has kept the SYMAPRO in uninterrupted active operation for more than ten years. When the system was being implanted in all areas, and afterwards, it was linked to the statistical process control programme, to the ISO, to health and safety at work, to social programmes (alcoholism, family break-ups, the pensions system) and to the strategic plans for every operational cycle. It has become the core of communication and learning in the organization, and has always maintained its measurement results and improvement proposal elements.

The main aim in the renewal stage of the SYMAPRO is to change parts of the implanted routine to maintain positive impacts on productivity. After each cycle, the objectives, indicators and parameters of the system and reviewed and updated if necessary.

The significant results of the system are reviewed too, and also the total and partial measurements, the improvement proposal implementation procedures, the participation of staff in the feedback meetings, and the training capsules. Depending on this analysis, it may be decided to change some procedures or practices so as to improve the system as a whole.

One key aspect of this review of the SYMAPRO is an examination of how it connects with other projects and strategic lines of action in the organization. For the SYMAPRO to make a positive impact it will have to be coordinated with projects and programmes that are crucial for the organization. This may be in the sphere of human resources management, linking this area to self-help initiatives like alcoholism treatment or interpersonal relations, or the area of skills-based or safety management, for example. Or the connections can be to work organization, to order and cleanliness systems like the "5S" or TPM (Total Productive Maintenance). There may also be links to the introduction of new technologies like new instrumentation or automation, to quality systems like the ISO, or to environmental protection schemes.

There are mutual advantages to links like these. The areas and programmes benefits insofar as they become anchored in measurable results and generate improvement proposals, and the SYMAPRO benefits because its role in the organization is strengthened, and it becomes more and more a core instrument for ongoing learning in all areas and departments.

What are the most common difficulties in SYMAPRO management?

Not all organizations manage to adhere to the SYMAPRO as it moves through its various stages from start to consolidation, maturity and renewal. This is partly because, in practice, these stages do not terminate but continue and co-exist with subsequent stages. Aspects that belong in the start stage may re-appear when the system has reached maturity, for example if a new SYMAPRO coordinator has to be appointed. However, the bulk of the implantation process is put into practice in the maturity stage.

In come cases the implantation process can lose ground. This can happen if there are leadership problems in the coordination of the system, or if there are changes in management in the organization or lack of support from management. Any of these eventualities can hinder or interrupt the progress of SYMAPRO implantation, or even make it necessary to start again at the initiation stage. There are cases of organizations that have re-started the SYMAPRO two or three times.

The typical problems that can cause the SYMAPRO implantation process to slip back can be classified as follows:

a) Conditions external to the system (lack of support, participation or leadership on the part of management in the organization).

b) Conditions internal to the management of the system (failure to maintain the commitments agreed).

c) The way the system is organized (lack of consensus about feedback meeting scheduling, not respecting the meetings programme, lack of adequate planning or communication about the meetings).

d) Problems in the application of the system's methodology or techniques (measurements not precise or objective, inadequate or inopportune processing of measurement results, deficient facilitation at the feedback meetings, lack of preparation for these meetings).

TYPICAL PROBLEMS

- Lack of discipline in the use and processing of measurement forms.
- Deficient leadership or preparation by middle management, which makes the meetings a routine with little meaning.
- Measurements that are not objective.
- Inadequate data processing – failure to respect the programming of meetings.
- Lack of participation or leadership from managers.
- Lack of follow-up on commitments.
- Not knowing how to be innovative in the dynamic of meetings or in training aspects.
- Problems coordinating schedules.

What do the SYMAPRO learning networks consist of?

There is no single correct prescription for handling difficulties in the SYMAPRO and constructing a suitable path to implement the system in an organization. But what is available to organizations is the stock of experiences and learning accumulated by other institutions that have implanted the SYMAPRO.

There are networks of organizations that have implanted the SYMAPRO. These consist of informal but systematic systems to share experiences, and they can be at the level of a sector or a region. In the sugar sector, for instance, there is a network that holds meetings twice a year, and organizations that have implemented or are implementing the SYMAPRO take part and share their experiences, forms, techniques and procedures.

At each of these meeting there is a main subject which is an aspect of the SYMAPRO, for example health and safety at work, skills-based training, working in teams, the role of the supervisor, quality systems, etc. This main theme is chosen in function of the network members' common needs and interests at that particular time.

Each organization makes a presentation about its experiences and proposed improvements in relation to the main theme and SYMAPRO implementation. This avoids repetition at the meetings, and it motivates the member organizations to experiment with new paths and constantly introduce innovations into the system.

Participation in this kind of learning network is part of the SYMAPRO management strategy, and it helps to sustain and improve the SYMAPRO as it constitutes a knowledge base that the participant organizations construct among themselves. For the network to function and keep operating systematically, leadership is needed, and the ideal candidate to play this role is a vocational training institution that works in cooperation with employers' and workers' organizations. Private consultants can join the network and even become the leader, provided they adhere to its basic philosophy of altruistically sharing knowledge.

The eighth meeting of the SYMAPRO network in the sugar sector, held in 2005 in Guatemala under the auspices of INTECAP (the Technical Institute of Training and Productivity of Guatemala).

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