

Using the Scorecard as a Tool for Piloting an Organization Part of the Supply Chain – a Simplified Model

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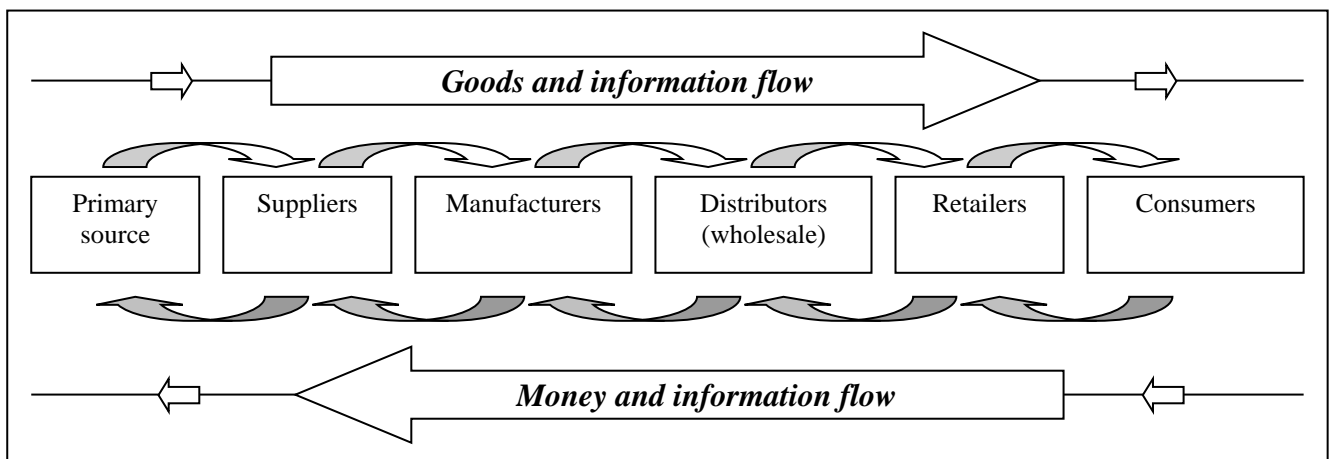
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1. Managing and measuring the performance of supply chain processes

1.1 Specifics in designing a high performance supply chain

The supply chain (Figure 1) is a network of organizations involved, through upstream and downstream connections, in various processes and activities that generate value as consumer products and services.

Figure 1. Supply chain of today



The supply chain has a few distinct features:

- an information flow;
- typical orders or demand signals;
- order signals for product suppliers;
- the flow of materials and finished products that fulfill demand;
- the payment flow;
- the information flow.

The objective of all efforts in a supply chain is enhancing competitiveness. This because, in the eyes of the consumer, for the competitiveness of products and services is responsible not a single organization, but an entire supply chain (SC). To convince a company to become part of a SC, successful situations must be created for all participant organizations, for a long way of working together.

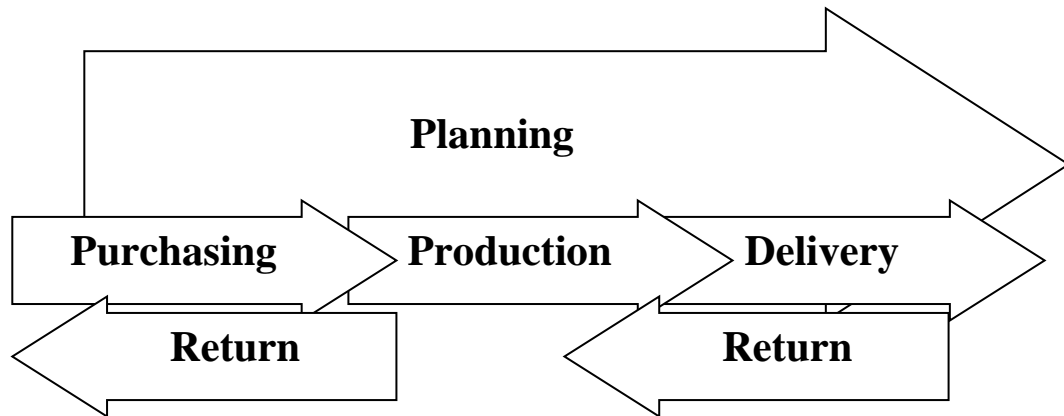
For the integration of the SC, participant companies must:

1. focalize on consumers, not on products;
2. understand the cost implied by satisfying the consumer and not the price tag of the product;
3. concentrate on the communication with the consumer and not only on promotion;
4. discover the way in which the consumer wishes to "buy" the convenience factor, instead of determining only their shopping place.

1. 2 The five major processes of a high performance supply chain

In the creation of a SCM – Supply Chain Management, it is important to pursue the integration between its processes, as well as with processes from other organizations, such as: technology, product/service development, marketing and sales, customer service.

Figure 2. The five major processes of Supply Chain Management



1. Planning

As inputs for planning, there is information concerning SC demand, reserves and resources. This information facilitates decision making and guides the SC activities that form the execution processes: purchasing, production, delivery and return. Each of these execution processes is an element for planning.

2. Purchasing

Utilizing the plan generated by purchasing planning, the purchasing process of SC obtains all materials and services needed through operational activities such as purchasing, scheduling, reception, inspection and supplier payment authorization. Purchasing also implies supplier selection and supplier relationship management.

3. Production

To increase flexibility and efficacy of capital utilization and minimize costs, more and more companies use external partners (outsourcing) for certain production activities, such as: production, certification, testing or packaging. This implies setting common objectives and processes throughout the extended network.

4. Delivery

The delivery process creates order visibility for the purchasing and production processes and ensures clear communication of customer requirements. Delivery also includes warehousing, transportation and distribution activities.

5. Return

The return process allows assuring, collecting and disposal of previously sold products, according to enterprise policies and customer agreements and includes activities from return authorization to financial declarations. The main causes for returns differ among industries, but include return defect, wrong or unsatisfactory products; maintenance, repair and reconstruction based on service agreements, excess inventory returns throughout the channel and recycling are types of return processes and each includes various activities, associated with each type of return.

Return also implies collecting a series of analytical information concerning the causes for return, locations and credits and most often, the central collecting points provide a way for collecting the volume of products in the most cost efficient manner.

1. 3 Using The Scorecard As A Tool For Piloting An Organization Part Of The Supply Chain.

An instrument capable of both operating within different structures/substructures of SCM and integrating the efforts of these structures/substructures to be aligned with SC objectives is the soft version of the Balanced Scorecard (BS). BS formally links global SC objectives with the strategies chosen for reaching these objectives with the help of general performance measures. Objectives, strategies and performance measures at SC level can all be aligned to organizational levels. At this level, organizations develop objectives, strategies for reaching these objectives and associated performance measures. This process is repeated at functional level within SC member organizations, and then ported to process level within various functions, developing their own objectives, strategies and performance measures, based on those of the function they belong to.

Figure 3. Deploying the scorecard in a supply chain

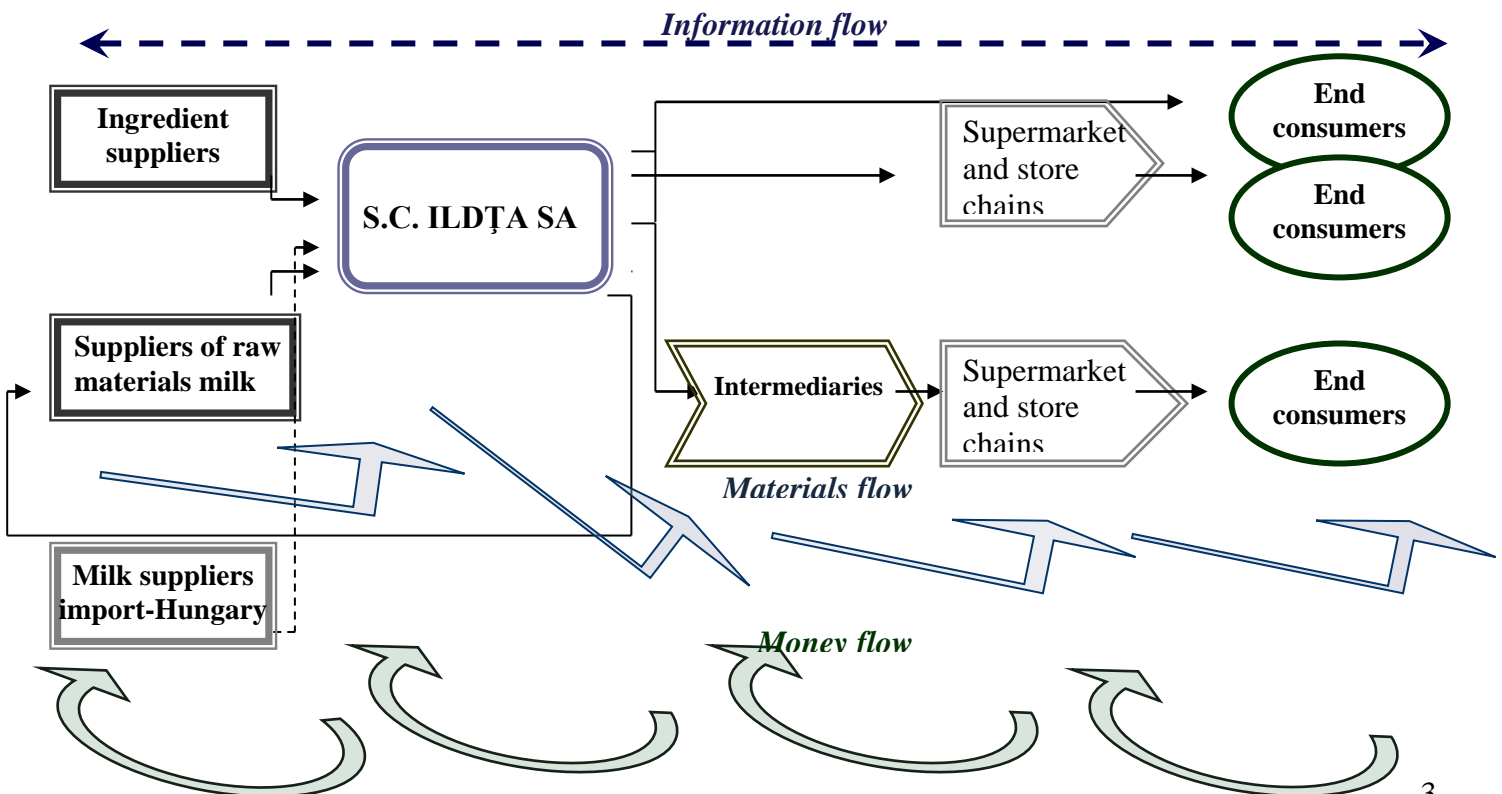
Supply Chain level Scorecard
Organizational level Scorecard
Functional level Scorecard
Process level Scorecard

As is the case with measuring organizational performance, this process in the case of an organization part of a SC implies the measurement of satisfaction on the following axes, while the indicators used will be aligned with the SC strategy, objectives, targets and measures:

- **Customer perspective**, which includes indicators such as **on time delivery, lead time, customer satisfaction** and **perfect orders fulfillment**.
- **Internal perspective**, which includes indicators such as **forecast accuracy, production quality, production flexibility**.
- **Learning and innovation perspective**, the most difficult to define axis, because its measures must reflect the efficacy of the company in acquiring new abilities. Staff objectives such as **Six Sigma training certification** are excellent for establishing relevant measures for this axis.
- **Financial perspective**, that includes measures such as **sold merchandise/goods costs, stuff expenses rates, (value added) productivity, asset rate**.

2. 1 The Logistic Chain of S.C. ILDTA SA

Figure 4. The Logistic Chain of S.C. ILDTA SA



The figure above represents the logistic chain of S.C. ILDTA SA formed, upstream, by fresh milk, materials and ingredients suppliers and downstream, by retailers that distribute the products to end consumers.

Fresh milk suppliers are divided in two categories: physical persons and micro-farmers from certain areas (selected by S.C. ILDTA SA) which, according to the contract, deliver daily a pre-established quantity of milk that is verified and collected from collection centers by the firm's trucks, via 13 routes, and moved towards the factory's warehouses; the second category, including enterprises/farms that, again based on contract, deliver fresh milk that is verified, collected and transported with the firm's trucks for processing. Up until this year, the fresh milk purchasing has been done from suppliers from certain districts, but the new European regulations concerning cattle farming, milk production and manufacturer's milk quota led to a crisis among milk manufacturers, which determined the firm to use imports of milk raw materials, from Hungarian manufacturers. Being products with high perishability, purchasing and production processes duration must be as short as possible, and the distribution planning, as realistic as possible.

The distribution of the company's products is done directly to end consumers, through its own four stores, as well as through store and supermarket chains recognized anywhere in the country. Sometimes, distributors are wholesalers. Beside dairy products, the firm manufactures a secondary biotic product, which is sometimes distributed to suppliers, based on agreements, as payment for raw materials supplied by them.

2. 2 Piloting the Supply Chain of S.C. ILDTA SA using the Scorecard

The proposal for the implementation of the Balanced Scorecard to evaluate and pilot the supply chain of S.C. ILDTA SA envisions a better utilization of distribution channel resources to generate growth of revenue and sales to end consumers.

A first major step in this direction is determining the SC partners to engage in the implementation of this project. From the key partners, the firm must identify those that are open for collaboration, those that can be persuaded, as well as those that are hostile, but also the ways to engage and motivate the partners in implementing this collaborative project. In most cases, the partnership is initiated upstream, by identifying the most important suppliers and starting an alliance with them. This is because, in the majority of cases, the suppliers are more receptive to collaboration and improvement projects.

This is also the case for S.C. ILDTA SA, for which an upstream partnership is the starting point because the suppliers (the key ones) are more easily convinced about the benefits of a closer collaboration, given their weaker position on the market, compared to the enterprise. In order to select the supplier with which S.C. ILDTA SA may initiate a SC partnership, a supplier importance analysis is required, based on the quantity of raw materials (fresh milk) delivered yearly and its cost.

The key suppliers of milk raw materials are presented in the table below:

Table 1. Suppliers of milk raw materials of S.C. ILDTA SA

Art.	Supplier Name	Quantity hl /year	% of total fresh milk quantity
1.	S.C.INDUSTRIAL CONSTRUCT	3650	3%
2.	S.C. COMITPEN SRL	730	0.5%
3.	S.C.CARPATI MODERN SRL	7300	5.8%
4.	S.C.AGROINDAF AFUMATI S.A.	9125	7.2%
5.	ICDB BALOTESTI	10220	8.2%
6.	S.C.TERA TITU	1277	1.0%
7.	S.C.TONICO GENERAL COM	32485	25.7%
8.	S.C.AGROZOOEHNICA	1460	1.1%
9.	S.C.ECOPROT IMPEX SRL	4015	3.1%
10.	S.C.PITIS NUCET	1825	1.5%
11.	S.C.BACIU COM SRL	547	0.5%
12.	S.C.AGROMILK SRL	2190	1.7%
13.	A.F. LUNGU	1095	1.0%

As can be observed from the table above, the most important supplier of raw materials for S.C. ILDTA SA is S.C. Tonic General Com SA, with a 25.7% of the yearly delivered milk volume. Thus, given the importance of this supplier in the firm's purchasing process, it is indicated that a partnership be formed with it, mutually beneficial, for a sustained growth of the business.

Following the strategic alliance with the selected partner (S.C. Tonic General Com SA) on the SC, the firms jointly analyze and formulate the SC strategy, from which objectives and strategies will be deployed, aligned at organization, division, department and function levels.

The SC strategy of S.C. ILDTA SA is that of increasing the customer base and their loyalty, to reach the objective of revenue and product availability growth. The objectives of S.C. ILDTA SA aligned with the joint strategy are 11% revenue growth and 3% market share growth, as well as improved order fulfillment.

Starting from these SC objectives, it is proposed to move to establishing of derived/aligned objectives for each of the scorecard axes.

Following the setting of relevant and measurable objectives for each of the scorecard axes, a number of key performance indicators (KPI) will be jointly selected, aligned with these objectives that will be monitored monthly by an interorganizational team that represents both parties of the alliance.

A series of these indicators are compounded by other indicators that will be monitored at least monthly as well, as needed, either by the interorganizational team, or by department managers, appointed by each company.

Starting from the SC scorecard, scorecards for each partner will be deployed, aligned with the SC scorecard.

The general scorecard proposed for S.C. ILDTA SA is aligned with the SC scorecard and will be deployed for each of the firm's major processes. In evaluating the firm's performance using the scorecard, Performance Dashboards will be filled for each process and the results will be used to elaborate the general organizational scorecard.

For large and very large organizations, the scorecard deployment process can be continued on enterprise levels such as sections and work formations.

S.C. ILDTA SA is a medium sized enterprise, thus a deployment to department level should be sufficient.

For the **purchasing process**, the table will be constructed starting with formulating the strategy and objectives for this department, aligned of course with the firm's strategic objectives and SC objectives.

As can be observed in the table below, for the **purchasing process**, the scorecard focused on evaluating three aspects of the process, on three major axes: financial, quality and technology, and learning and stuff. Following the analysis of this major process, the weighted score shows large gaps (216.5 points) in the planned level for the year 2010 compared to the effective level. There are multiple causes for this and they will be analyzed for each of the dashboard axes. The largest difference for the weighted score comes from the first axis, the financial axis, which indicates problems related to the cost of raw materials, and also to the cost associated with quality parameters of collected milk. The reason for high costs of raw materials milk is mainly due to the limited number of milk producers that conform to the increasingly strict UE requirements concerning the animal care conditions and quality parameters of collected and processed milk. Thus, the firm is forced to import raw materials milk or support the suppliers/partners in conforming to the new requirements (the firm already does this by supporting the investments of certain key partners in modernizing their farms/micro-farms), but each of these options requires additional financial resources. Concerning the quality and technology axis, the differences are the consequence of unsatisfactory quality of raw materials milk (that seems to either have lost its properties due to inadequate transportation conditions, or the bad quality was not identified during testing upon collecting), that doesn't meet the parameters required in production.

Table 2. The purchasing process scorecard

Axes	Strategic objectives	Key indicators	Weight	Analytical hierarchy	Maturity degree					Weighted score S.C. ILDTA	
					1	2	3	4	5	Actual A 2006	Plan P 2010
Financial perspective (300)	2% reduction of raw materials costs	Payment accuracy	180	54			P A			162	162
		Reduction of nonconforming raw materials costs	210	63			A	P		189	252
		Inventory (in days)	210	63				P A		252	252
		Raw materials costs	220	66		A	P			132	198
		Staff remuneration costs	180	54			P A			162	162
	Total		1000							897	1026

Quality and technology perspective (350)	1. More strict control of raw materials quality	Reduction of nonconforming raw materials percentage	250	87,5				A	P			262,5	350	
	2. Improving the technology for collecting and transportation of fresh milk	Technology for transportation and warehousing of raw materials	250	87,5				P	A				174,4	174,4
		Better selection of fresh milk suppliers	250	87,5					P	A			262,5	262,5
		Improving the methods for verifying the quality attributes of fresh milk at collecting	250	87,5				P	A				174,4	174,4
	Total			1000								873,8	961,3	
Stuff and learning perspective (350)	Initiation of staff training programs	Improving staff qualification	330	115,5				P	A			231	231	
		Management team Supplier Relationship Management (SRM) abilities and competences	370	129,5				P	A			259	259	
		Motivation level of purchasing department staff	300	105					P	A			315	315
	Total			1000								805	805	
TOTAL												2575,8	2792,3	

The building of the **production process scorecard** will start with establishing the strategy and strategic objectives for each dashboard axes, followed by the identification of measures aligned with these objectives.

As can be observed (Table 3) in the level of the weighted score for the **production process**, gaps are present on all four axes analyzed, and the causes for this will be presented below. For the financial axis, the gaps are due to the risk of nonconformity with the parameters required by the production process; for the quality axis, a cause could be the weakly defined procedures for production sub-processes and activities; in the case of technology and innovation, the low scores for research and development activity indicate a low capacity for innovation and new product introduction, that will attract and retain consumers on the market. Concerning the investment in acquisitions and modernizations of technologies and production and warehousing equipment, the firm is on a progressive plan, by planning investments for improving fixed assets (two large projects from European sources). The staff and learning perspective has a very large deficit to cover, because the production staff is not well trained and most often is not properly qualified, while there are no significant improvement and qualification programs. Also, the motivation through salary is low (net average income of 640 RON in 2005), especially when compared with the management (4055 RON).

Table 3. The production process scorecard

Axes	Strategic objectives	Key indicators	Weight	Analytical hierarchy	Maturity degree					Weighted score S.C. ILDTA			
					1	2	3	4	5	Actual A 2006	Plan P 2010		
Financial perspective (220)	Production costs reduction	Raw materials costs	270	59,4				A	P		178,2	237,6	
		Production process failings costs	250	55				P	A		165	165	
		Production process errors costs	260	57,2			A	P			114,4	171,6	
		Transformation cost	220	48,4				P	A		193,6	193,6	
	Total		1000								651,2	767,8	
Quality perspective (280)	Production process quality improvement	Process errors	260	72,8				A	P		227,4	291,2	
		Production return rate	250	70			A	P			140	210	
		Outdated production technologies and equipment	220	61,6					P	A		246,4	246,4
		Food industry mandatory standards implementation	270	75,6					P	A		302,4	302,4

	Total		1000							907,2	1050
Technology and innovation perspective (270)	2 new product introductions	Number of new products launched in the last year	220	59,4		A	P			118,8	178,2
		Number of patents and licenses created in the last semester	210	56,7	P A					56,7	56,7
		Investments in new technologies and equipments	200	54					P A	270	270
		Level of automatic and computer controlled production	180	48,6			P A			145,8	145,8
		Labor productivity	190	51,3				P A		205,2	205,2
	Total		1000						796,5	855,7	
Stuff and learning perspective (230)	Staff qualification growth	Production personal qualification	255	68,85			A	P		206,55	275,4
		Worker salary level	240	64,8			P A			194,4	194,4
		Training programs for production staff	265	71,55		A	P			214,65	286,2
		Production management team	240	64,8			P A			194,4	194,4
	Total		1000						810	950,4	
	TOTAL			1000					3 164,9	3 623,9	

For the **delivery process**, a four axes scorecard will be built, ultimately oriented toward customer satisfaction, with objectives and measures aligned with those at organization and SC level. According to the weighted score below (Table 4), the **delivery process** has the largest gap between targets and effective levels for 2006. For the first axis, the financial one, purchasing costs remain at relatively the same level. For the customer axis, advertising costs reduction and the organization of promotions for the firm's products will have a smaller growth than the expected customer base and at a reduced loyalty level. Also here, a weak order management prevented reaching the customer orders fulfillment target, due mostly to inadequate skills of the distribution management team (in distribution process monitoring and control), as revealed by the staff and learning axis and the lack of training programs in the distribution department. The lack of order delivery activity control and monitoring translates into unsatisfied customers and an increase in the number of customer complaints and thus, into losing customers and additional costs with the return activity management.

Table 4. The delivery process scorecard

Axes	Strategic objectives	Key indicators	Weight	Analytical hierarchy	Maturity degree					Weighted score S.C. ILDTA	
					1	2	3	4	5	Actual A 2006	Plan P 2010
Financial perspective (200)	Return costs reduction	Finished goods inventory costs	200	40				P A		160	160
		Administrative costs of customer contracts and relations	150	30				A P		120	120
		Customer loyalty creation costs	200	40			A	P		120	160
		Promotional and discount activities costs	150	30			P A			90	90
		Labor costs	180	36			P A			108	108
		Return costs	120	24			P A			72	72
	Total		1000						670	710	
Customer perspective (350)	Increasing customer satisfaction	Customer loyalty level	250	87,5		A	P			175	262,5
		Customer base growth	200	70			A	P		210	280
		Customer order fulfillment level	250	87,5			A	P		252,5	350
		Order cycle	100	35			P A			105	105
		Customer requirements response level	200	70			A P			210	210
	Total		1000						952,5	1 207,5	
Staff and	Increasing	Staff qualification level	200	50			P A			150	150

learning perspective (250)	staff motivation level	Training programs	200	50			A	P			100	150
		Staff motivation level	220	55			A	P			165	220
		Management team abilities and qualification	380	95				P A			285	285
	Total		1000								700	805
Quality and technology perspective (200)	Better order management	Percentage of nonconforming products in deliveries	250	50			A	P			150	200
		Percentage of unsatisfied customers	260	52			A	P			156	208
		Percentage of unsolved complaints	260	52			A	P			156	208
		Outdated warehousing and delivery technologies and equipment	230	46				A P			184	184
	Total		1000								646	800
TOTAL			1000								2968,5	3522.5

The scorecards for the three major processes of S.C. ILDTA SA are carefully filled and monitored by the process management team or the person appointed (project manager, process "owner") by the firm's management. The results of each process scorecard are then entered into the organizational scorecard, by the CEO or the firm's management team. Since the firm is a medium sized enterprise, the dashboards will be monitored monthly, and the general scorecard will be modified twice a year in order to avoid entering redundant information.

Table 5. The scorecard of S.C. ILDTA SA

Axes	Strategic objectives	Key indicators	Weight	Analytical hierarchy	Maturity degree					Weighted score S.C. ILDTA		
					1	2	3	4	5	Actual A 2006	Plan P 2010	
Financial perspective (250)	11% revenue increase	Profit rate	180	45			A	P			135	180
		Purchasing costs	190	47,5			P	A			142,4	142,5
		Sales growth	220	55				P	A		220	220
		Production cost	220	55			P	A			165	165
		Labor productivity	190	47,5				P	A		190	190
	Total			1000							852,4	897,4
Customer perspective (250)	1. 3% market share increase	New product introduction	130	32,5		A	P				97,5	130
		Customer base growth	160	40			A	P			120	160
		Complaint rate	140	35			A	P			105	140
	2. Customer loyalty increase	Product promotion level increase	130	32,5			P	A			97,5	97,5
		Customer loyalty level increase	150	37,5		A	P				75	112,5
		Order fulfillment rate	140	35			A	P			105	140
		Lead time	150	37,5				P	A		150	150
Total			1000							750	930	
Internal perspective (250)	Production quality improvement	Innovation level	180	45		A	P				90	135
		Raw materials return rate	180	45			P	A			135	135
		Operational returns	140	35			A	P			105	140
		Quality standards adoption according	200	50				P	A		200	200

		to industry specifications											
		Number of contracts with partners	120	30			P A				120	120	
		Production cycle duration reduction	180	45			P A				135	135	
		Total		1000							785	865	
Learning and growth perspective (250)	1. Staff training programs increase	Qualification level increase	100	25		A	P				50	75	
		Management team qualification and abilities	160	40			P A				120	120	
		Training programs	140	35		A	P				70	105	
	2. Staff motivation level increase	Staff remuneration level	90	22,5			P A				67,5	67,5	
		Work conditions	120	30				P A			120	120	
		Project team incentives	120	30			A	P			90	120	
	3. Improving technologies, equipments and programs	Investments in technologies	130	32,5				P A			130	130	
		Physical and moral depreciation of production technologies	140	35				P A			140	140	
		Total		1000								787,5	877,5
	TOTAL				1000							3174,9	3569,9

From the analysis of the weighted score from the S.C. ILDTA SA scorecard it can be observed an amplification of differences between planned and effective levels. For the customer perspective, the problem to be solved is related to the reduced capacity for new product introduction that would attract and retain customers, the low number of advertising programs and promotional campaigns that would lead to customer base increase and improved loyalty, but also to the lack of a procedural control for customer order delivery process that would reduce customer complaints. The internal perspective reveals major deficiencies in the interest for investing in research and innovation as a basis for the production process, leading to reduced competitiveness of the firm's products on the market. The growth and learning perspective reveals problems with both staff qualification and motivation through training programs and the remuneration program.

This kind of planning, by deploying scorecards covering the major processes of the organization, will also have to be done by the project partner, S.C. Tonico General Com.

Following the analysis of the results from evaluating the performance of the two organizations using the general scorecard, the data and information will be transferred to the trans-organizational project team (including representatives from both partners, upstream in the SC) that will incorporate them in the SC scorecard. Thus, the project team will meet monthly to analyze the results from the general scorecards of both organizations and based on this analysis, the team will update the level of indicators in the SC scorecard and will study the gaps between their targeted and effective levels, and based on these gaps, the team will propose and establish improvement solutions and projects in order to reach the missed objectives and targets.

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