LIFE CYCLE MANAGEMENT IMPLEMENTATION OF FOOD PRODUCTS AND SERVICES

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Abstract: *The aim of this paper is to develop integrated management systems by implementing, in an IMS, the lifecycle management of products and services (LCA) under a Management System, already existing Quality – Environment – OSH.*
The first part of the article contains a brief summary of the data in the literature on the principles and stages of implementing an Integrated Management System in an Organization. It continues with the implementation of LCA in a comprehensive way: the final product - for example apples. This includes a series of processes analyzed such as: apple cultivation, collection, transportation in regional centers, packaging, sales in retail markets and hypermarkets, plus related servants involved in the manufacture of packaging, washing machines, recycling, etc.
In the second part of this article, we focus our interest on meeting the requirements of reference standards SR EN ISO 14040 series on LCA Management with SR EN ISO 9001 - Quality Management System. It further shows how the system design and system procedures are provided with mandatory operational procedures as well as the forms required by the SR EN ISO 14040 series standards.
The approach takes into account the evolution of induced systemic process of economic globalization that makes it difficult to enter a business in one of the production chain of a product demanded by the market.

Keywords: *Management System, apple cultivation, collection, transportation, packaging, sales*

Introduction

Frequently, the Integrated Management System implementation includes the reference standards of Quality, Environmental and Occupational Health and Safety, with certification completed by a recognized and accredited certification body.
JM Juran trilogy was postulated as follows: Planning, Control and Improvement of product quality and process - carried out by the Juran Institute - which insists on effective implementation (efficiency and effectiveness) of these standards, without putting emphasis on Certification.
Our goal is to implement these integrated systems into small and medium-sized companies with emphasis on the integration of food in the flow of firms offering final product on the shelf.

We firstly implemented the reference standard SR EN ISO 9001:2008. It introduces order and predictability in the management of companies / organizations.
The standard requires clear determination of system processes, clear targets (by policy) and development of procedures for specific processes.
Compulsory rules have been established to check the documents and records management policy and commitment, market position, control of human, material and authority, to achieve control of products / services and how to monitor the products / services which do not comply with the auditing processes and analysis management.
The certification aims at ruling the 3-D System: Documents (the existence of documentation), Describes (documentation is known and implemented), Shows (as

practical action + records).
It monitors the implementation of the PDCA cycle (Plan - Perform - Check - Act) and the ability to continuously improve the system.
The implementation of the referential SR EN ISO 14001:2005 Environmental Management has been imposed from two converging directions: efficiency (seen as loss of energy and materials) and environmental impact and pollution (penalties, image, notes).[1]
The referential meets the main requirements of ISO 9001 and brings - minimal - Identification of environmental aspects and environmental impacts assessment, emergency preparedness and response capacity, and management and disposal.
The implementation of the referential SR OHSAS 18001:2007 Occupational Health and Safety Management was subsequently required two-fold: OSH (Occupational Safety and Health) and OHS (Occupational Health and Safety), with specific approaches and nuances.
And this includes the referential main requirements of ISO 9001 and brings - still minimal - hazard identification, risk assessment and control, emergency preparation and response capacity SSM approach.
One way of integrating the last two referential standards is by implementing them as a starting point with clause 6.4.4 - work environment.
LCA - Life Cycle Assessment (Life Cycle Assessment), as shown in SR EN ISO 14040 standard itself, is a technique for assessing environmental aspects and potential impacts associated with a product, by:

- Developing an inventory of relevant input and output elements of a system-product;
- Evaluating the potential environmental impacts associated with those inputs and outputs;
- Interpreting the results of inventory analysis and assessment phases of the impacts in relation to the objectives of the study.

LCA studies the environmental aspects and potential impacts of the product life cycle (cradle-to-grave) from raw material acquisition, continuing with the production, use and post-use. [2]
General categories of environmental impacts, which are required to be taken into consideration include resource use, human health and environmental consequences.
Note that LCA introduces the concept of "system-product" and analyzes a stream that includes several processes which basically are small / medium with its Integrated Management Systems.

For example, in Figure 1, we present a transport stream of apples packed in corrugated cartons.

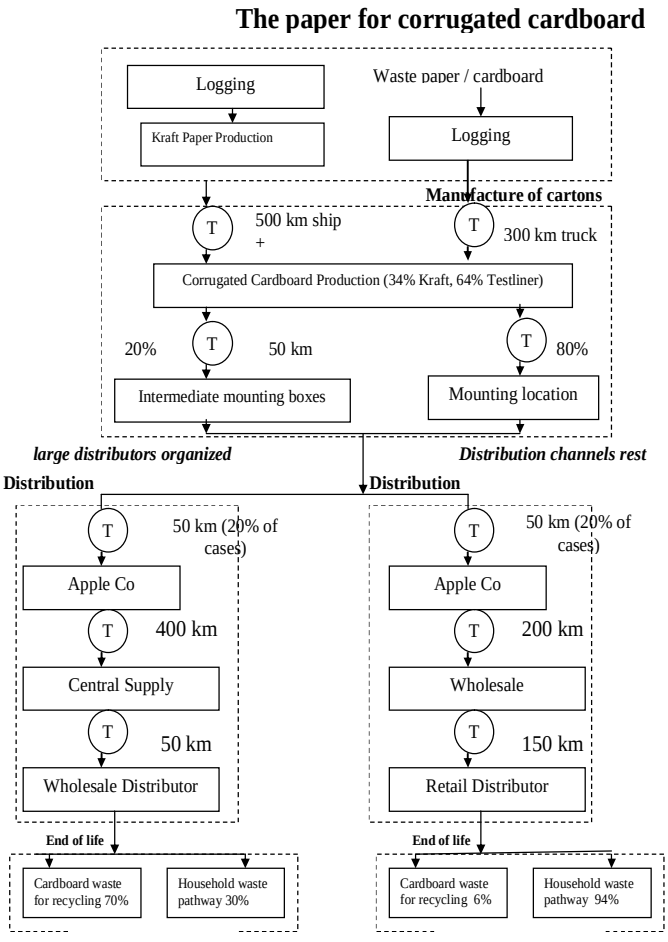

Figure 1. Phases of LCA

These concepts and standards are fully assimilated and implemented in the European Union (EN) and national default (SR). On the Romanian market of all the major certification bodies operating certification are the credentials interconnected through mutual.

Experimental

Integrated Management System requirements include implementation of Quality Management Standards, Environmental and Occupational Health and Safety.

We assume that firms have already implemented an integrated system and want to extend the scope of certification, at which point they will have to demonstrate that the revised documentation comply with the standards.

Typically, the implementation of the systems on the skeleton of SR EN ISO 9001:2008 based on the premise that this system was initially implemented (at least for 3 years), and having already documented and implemented procedures for the system that are imposed and other standards, in equivalent terms, as presented in Table 1.

Table 1
Mandatory procedures related to the terms of referential standards

Procedure	Clauses of ISO		
	9001	1400	1800
PS 4.2.3 Document Control	4.2.3	4.4.5	4.4.5
PS 4.2.4 Control of records	4.2.4	4.5.4	4.5.4
PS 8.2.2 Internal Audit	8.2.2	4.5.5	4.5.5
PS 8.3 Control of	8.3	4.4.7	4.4.7
PS 8.5.2 Corrective Action	8.5.2	4.5.3	4.5.3.
PS 8.5.3 Preventive action	8.5.3		2
PO 5.6 Management review	5.6	4.6	4.6
PO 6.2.2 Competence, training and awareness	6.2.2	4.4.2	4.4.2
PO-7.2 Customer related	7.2	4.4.6	4.4.6
PO-7.3 Design	7.3		
PO-7.4 Supply	7.4		
PO-7.5 Production and service	7.5		
PO 7.6 Control of monitoring and measuring devices	7.6	4.5.1	4.5.1

These procedures are mandatory system standards required by the terms of the three referential standards. We recall that any certification audit is required, whereas mandatory, internal audits and report require last analysis management.

Implementation of Environmental Management requirements and standards of Occupational Health and Safety procedures require a series of compulsory measures. See Table 2.

Table 2
Introduced additional procedures referential standards 14001 and 18001

Procedure	ISO Clauses		
	9001	14001	1800
PS-4.3.1 Identifying environmental aspects and environmental impacts	5.2 7.2.1 7.2.2	4.3.1	4.3.1
PO 5.5.3 Internal	5.5.3	4.4.3	4.4.3
PO 4.4.7 Emergency preparedness and response	8.3	4.4.7	4.4.7
PO-6.4-1 Hazard identification, risk assessment	5.2 7.2.1	4.3.1	4.3.1
PS-4.4.6 Management and waste disposal	7.5	4.4.6 4.3.2	4.4.6 4.3.2
PO 4.3.2 Legal and other	5.2		

These system procedures are specific referential standards ISO 14001 and ISO 18001 and there is a minimal scheme that can add forms, work instructions or operating procedures, and specific activities of the office.

The process begins with establishing processes on Form F-4.1 SMI-a process map and this one contains the procedure and necessary records.

The authors are at your disposal with the necessary advice from the experience of over 70 implementations and certification systems with more than seven internationally recognized Certification Bodies. „Green" concepts have brought a new set of standards SR EN ISO 14040 Series Environmental Management Life Cycle Assessment Principles and framework (Life Cycle Assessment) or abbreviated LCA.

These standards promote a new philosophy of product design thought from the beginning, taking into account the consumption of raw materials, manufacturing, its life cycle until the end of life (preferably by recycling). [4]
The whole process includes defining the purpose, scope and inventory analysis, life cycle impact assessment, life cycle interpretation, all in a data format of the documentation set.
Given the technical rule of these various standards supporting soft-ware sites have emerged.
The SR EN ISO 14040 principle states within the framework of life cycle assessment the following:
- In Clause 4.1 - Key Features of LCA stipulates that there „is no single method for conducting LCA studies. Organisations should have flexibility to implement virtually LCA as set forth in this International Standard, based on specific application and user requirements." By this, we postulate that there are no systems or soft-ware solutions universal - each system is unique and has its specificity, but must comply with referential standards.
- Clause 4.2 Phases of a LCA studies the main phases of LCA in Figure 2. [5]

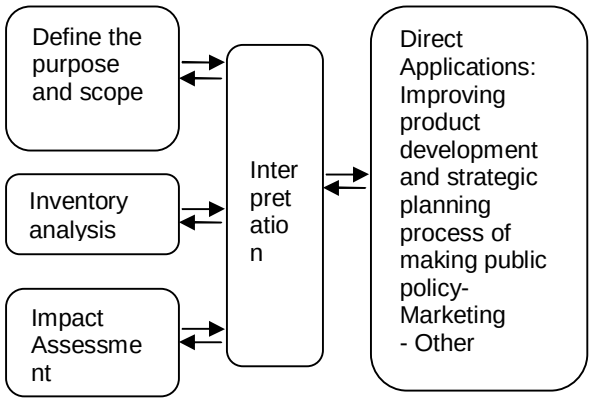

Figure 2. Phases of LCA

It further establishes the general methodological framework, reporting and how to perform critical analysis.
SR EN ISO 14041 defines the purpose, scope and inventory analysis in detailing steps, the working and structure of reports produced. All provisions of the standard should be applied, as it introduces the concept of system-product. [3]
SR EN ISO 14042 life cycle impact assessment - LCIA - is Stage 3 of the LCA and assessment process aims to assess the results of the analysis of life cycle inventory (LCI) of a system-product.
SR EN ISO 14043 Life cycle interpretation - concerns the interpretation of data following the next steps required:
- Overview of life cycle interpretation
- Identification of significant issues
- Assessment
- Conclusions and recommendations
- Reporting
- Other investigations

ISO-TS 14048 documentation format of the data structure of tables detailing is even used in developing the LCA studies.
In this perspective, practical experience in implementations and the system require the records presented in Table 3.

Table 3
Procedures and Forms brought by 14040 additional reference standards

Document
F-3-1 Terms and definitions
PO-6.4-40 LCA – Principles and framework (SR EN ISO 14040)
PO-6.4-40-1 LCA – Define the purpose, scope and inventory analysis (SR EN ISO 14041) F-6.4-40-1-1 Input form for carrying supplies F-6.4-40-1-2 Data sheet for internal transport F-6.4-40-1-3 Data sheet for the unit process F-6.4-40-1-4 Centralize data sheet for the life cycle inventory analysis
PO-6.4-40-2 LCA – Life cycle impact assessment (SR EN ISO 14042)
PO-6.4-40-3 LCA – Life Cycle Interpretation (SR EN ISO 14043) F-6.4-40-3-A1 Structuring data for input AND output LCI life cycle stages F-6.4-40-3-A2 Percentage contributions of input and output of the LCI in the life cycle stages F-6.4-40-3-A3 Ranking of input and output of the LCI to stages of life cycle F-6.4-40-3-A4 Matrix structure of processes

grouped into groups F-6.4-40-3-A5 Classification by degree of influence of input and output data of LCI arranged in groups of processes F-6.4-40-3-A6 Marking the anomalies and unexpected results of input and output processes in groups F-6.4-40-3-A7 Structuring the class outcome Indicator (GWP) than life cycle stages F-6.4-40-3-A8 Structuring the category indicator results (GWP) than life cycle stages, expressed in percentages F-6.4-40-3-A9 Content verification completeness F-6.4-40-3-A10 Verification sensitiveness to allocation rulesF-6.4-40-3-A11 Checking the data uncertainty applied to sensitiveness F-6.4-40-3-A12 Verification sensitiveness applied to the characterization data F-6.4-40-3-A13 The results of consistency checks
PO-6.4-40-8 LCA - Format of the data documentation (SR ISO-TS 14048) F-6.4-40-8-A1 Process F-6.4-40-8-A2 Modeling and validation F-6.4-40-8-A3 Administrative information F-6.4-40-8-B1 Process F-6.4-40-8-B2 Elements of input / output elements F-6.4-40-8-B3 Modeling and validation F-6.4-40-8-B4 Administrative information

Conclusion

In recent years there has been accumulated a large volume of communications on LCA studies, and almost each of them claims fairness. To speak a common language we should relate strictly to the implementation of the reference standards SR EN ISO 14040 series and procedures and records required by them. It is good to make implementation a consultant may, by Curriculum Vitae, evidence that leads directly to people and businesses. Vision is needed for overall management, linking the action system - product assembly and parts (sub-systems) components. LCA requires that analysis be made by independent experts, preferably external, to ensure objectivity. Objectivity ensures correct conclusions that will lead to finding that waiver decisions on economic and environmental grounds, a number of other systems - a product which actually represents the chain of companies and business, technical facilities, capital and workers with families and local communities. [6] [7] [8]

There are no acknolwedged and acredited certification bodies of referential standards SR EN ISO 14040 series, still their application can solve the problem out – by developing a dialogue between stakeholders and consulting firms, creating regional accreditation bodies for our benefit.

The authors may provide available databases and software forms and useful information.

Abbreviations

IMS - Integrated Management Systems
LCA - Life Cycle Assessment
SR - Romanian Standard
EN - European Norm
ISO - International Organization for Standardization
PS - System Procedure
PO - Operational Procedure
F - Form

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