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## **Integrated Management Systems in Local Public Enterprise for Production, Distribution and Cleaning of Wasted Water**

**Abstract:** *Appearance of large number of management systems, with different and sometimes divergent demands, needs reconsideration of their implementation strategies and their integration in one integrated management system (IMS). So defined IMS would be designed and implemented in different areas. In this paper is presented basic concept of integration of partial management systems in areas of quality (ISO 9001), environmental protection (ISO 14001), occupational health (ISO 18001), food safety (ISO 22000) and accreditation of laboratories (ISO17025/ISO17020). As a pilot organization is choosed local public enterprise for production, supply and drain of water.*

**Keywords:** *Integrated Management System, production and distribution of water, cleaning of wasted water.*

### **1. INTRODUCTION**

In a past period, management theory and practice have rapidly changed, supplement and sometimes exclude each other. The result of that is presence of large number of management concepts, whose akronims can't be recognized not even by the experts of this particular area (e.g.: TPM, MBO, HRM).

During growth of quality and environment movement back in 90's appeared quality management system (ISO 14000), occupational safety and health management (OHSAS-ISO 18001), risk management system, and some others still in preparation (Figure 1).

Appearance of large number of management systems, with different and sometimes divergent demands, demand reconsideration of optimal strategies of introduction of these standards in national quality system and point question of their integration through integrated management system.

In this paper is presented basic concept of integrated management system and concept of integration of partial systems of management

from quality field and environment in government and business, applicated in pilot organization for production, supply and drain water with 770 employees.

### **2. IMS STRUCTURE**

Sistems developed so far, quality management system (ISO 9000) and enviroment management system (ISO 14000), occupational safety and health management (ISO 17000) appeared in the last decade of 20-th century. They're representing partial answers on above mentioned areas and particular quality demands. Therefore, there is high level of similarity between them (e.g., between ISO 9000 & ISO 14000), overlaping, but there are also specific demands for every mentioned management system. Meaning, that there is possibility of reestablishing proper relations between them afterwards (e.g. in Anex B in ISO 9000:2000) and by that execute attempt of their integration. There's a variety of reasons for this, and we markin of following:

- § reduced costs of development, implementation and maintance;
- § reduced certification costs;
- § management system compatibility, and by that more effective and effcent usage;
- § reduced involvement of scarce human resources experts;
- § reducing available documentation;
- § increasing business process transparency, etc.

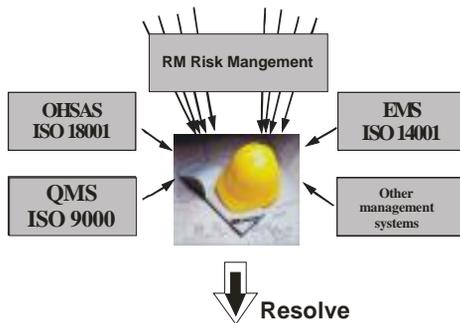


Figure 1. Integrated management system

### 3. WAY TO INTEGRATED MANAGEMENT SYSTEM

In organization theory, there is a basic rule:

1. foremost decomposition of different systems;
2. isolation of key element of integration and
3. integration of decomposed systems.

What is mutual, namely, which integration elements are key for above mentioned area? Above all, those are:

- § same stakeholders, that is interest groups (employees, management, business associates, population, state, stockholders);
- § same organization and enviroment processes;
- § same method and techniques, theory and practice of management;
- § similiar concepts of process management;
- § similiar resource management;
- § equal measuring, analysys and improvement concepts;
- § same top management responsibilties;

- § same vision, mision and business politics of organization.

These common elements obtain based on observing organization from diffrent views. Besides common IMS elements, we noticed specific elements for every partial management system too.

Next, important question, that we need answer to is, which of mentioned integrated systems should be "the core" of integration?

Answer to these questions depends on:

- § already implemented managemnt systems in organization;
- § business area, category of documented business processes;
- § predominate stakeholders requests.

However, cause of QMS documented application in accordance to ISO 9000, and cause of process approach utilized with in represent good foundation for integration, suggestion is that in a most casies "core of integration" should be QMS.

Besides that, other solution sholud be take in consideration, other "core of integration", cause of specific nature of business processes and stakeholder requests.

Example of management integration procedure based on ISO 9001, is making possible integration of other management system, starting from identification and defining:

- § market state and needs;
- § politics and goals;
- § resources and resource management;
- § management systems;
- § communication systems;
- § process management (including actions and operations too);
- § measurement, analysys and improving systems;
- § reconsidering management systems.

Appreciating integration of different management systems has own strategic and tactical component. Strategic component refers to decision about management system integration, "core integration" definition, defining integration and procedures, with obligational determination of goals and management system integration strategy.

Tactical component refers to plan making and program integration, surveying management system integration procedure, making decisions in particular control points and reporting for strategic level.

#### 4. IMS PROJECT CHARACTERISTICS

As previously stated, IMS project is complex project with recognized risk aspects. Each subproject has own risk in design and implementation, and is recognized risk of integration. Experience of project teams and management of this project is needed condition, but is not sufficient. It is reason why used team organization with very close connection between consultants and working teams (Figure 2).

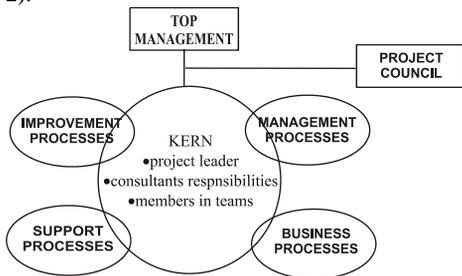


Figure 2. Project organization

For pilot organization in area of water supply and cleaning wasted water we recognized goals, processes based on strategic (top down) approach (Table 1) and following strategic statements:

#### VISION

West Balkan region lider in supplying consumers with necessary quantity of quality and properly healthy water and draining and cleaning of wasted water.

#### MISSION

Reliable consumers supplying with necessary quantity of quality and properly healthy water and draining and cleaning wasted water.

#### POLITICS

Providing necessary quantity of quality and properly healthy water and draining and distilling wasted water, with respecting requests of interest groups:

§ Founders, from aspect of regular supplying of quality and proper health drinking water and protecting health care protection of population and protecting environment by draining and distilling of wasted water,

§ Employees, from aspect of occupational health and safety, as economical based payment too,

§ Residents, from aspect of getting necessary quantity of quality and properly healthy drinking water and draining wasted water, as protecting environment, with economical acceptable price,

§ Business systems, from aspect of regular supplying of quality and properly health drinking water,

§ Government, from aspect of harmony development of supplying of necessary quantity of quality and properly health drinking water, protecting environment and health care,

§ Management, from aspect of effective and efficous process management of water supplying and draining and distilling wasted water, with respect of limited water, financial and local resources.

Table 1. Organizational goals and processes

NO	GOAL	PROCESS
1	Increasing of water production	P1: Production and distribution of water
2	High quality of water	P2: Assurance of quality and safety of water
3	Draining and cleaning of wasted water	P3: Collection, draining and Cleaning of wasted water
4	Improvement of support	P4: § Maintenance § Transport § Selling § Purchasing § Etc.
5	Reduction of water loses and electric power and better payment for water consumption	P5: § Registration of water joints § Registration of consumers § Energy reductions
6	Improvement of environment protection	P6: Process of EMS
7	Improvement of safety on work	P7: Process of safety management
8	Accreditation of laboratory	P8: Calibration and Accreditation process

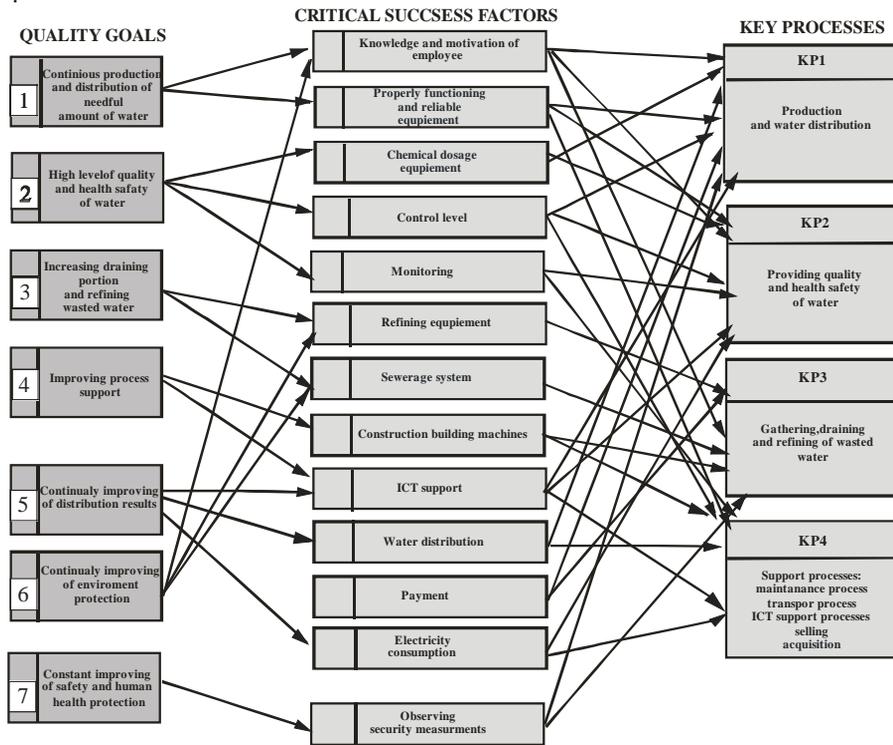


Figure 3. Determination of key processes using strategic top-down approach

Table 2. Consumption of consultant days

No	Phase	Consumption		
		6	12	18
1	Defining of project organization	2		
2	Realization of project plan	4		
3	Formulating and promotion of quality policy	2		
4	Identification of processes	2	0	
5	Analyse of existing management systems related to 5 ISO standards	4	6	
6	Defining the strategy and methods for IMS establishment	1	6	
7	Education of project Teams	2	3	

Table 2. continue

8	Education of employees		46	
9	Realization of documents for project management	8		
10	Detailed definition of processes		10	
11	Writing and adoption of documents		139	
12	Training for internal audit			15
13	Support for internal audit			8
14	Preparation for certification and accreditation			8
15	Sertification support			4
	<b>Subtotal</b>		121	
	195	35		
	<b>Total</b>	<b>351 consultant days + 700 user days = 1051 man days</b>		

Using top-down strategic approach are determined quality goals, critical success factors and key processes (Figure 3).

Design and implementation of IMS are related through combination of phase and

nucleus approaches with following consumption of consultant days (Table 2) during project period.

In Figure 4 is presented planned consultant and total working days during project period.

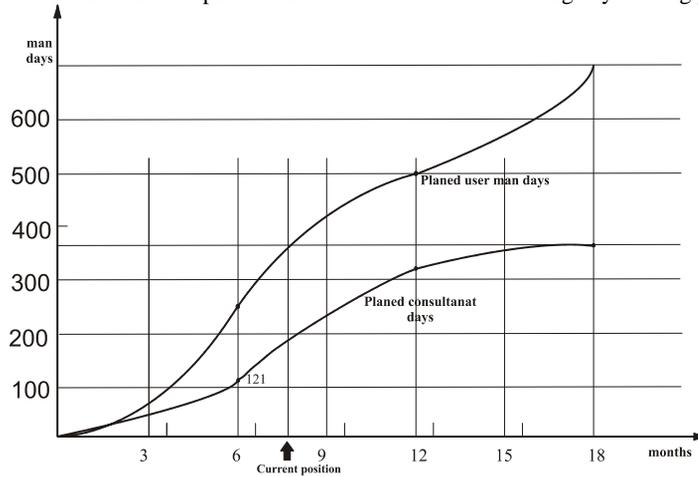


Figure 4. Expected flow of IMS project activities

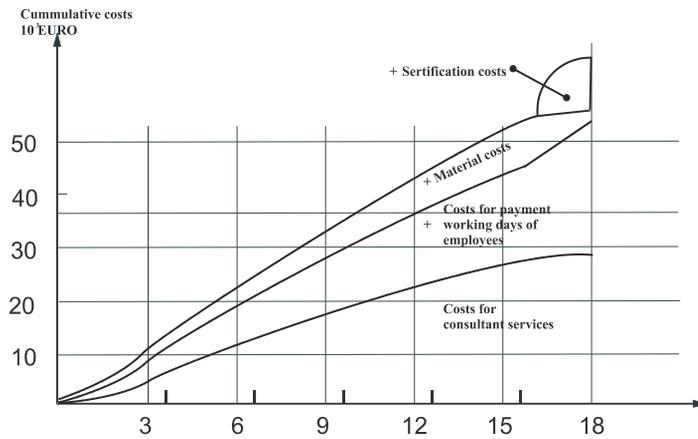


Figure 5. Cumulative costs during project period

In realization of this complex project are involved 32 consultants, 13 working teams with cca 42 employees. We expect in next phases engagement all rest employees (cca 700).

In first 3 months dominant role had consultant organizations (Center for Quality, Kragujevac, Serbia), and in next 3 months rapidly grow involvement of pilot organization. At the end of this project we expect total consumption of working (consultant plus employees) months about 800. It is result of greater expected effort on introduction and final

preparing for certification and accreditation.

If analyse this project from financial aspect, we can recognize dominant costs, presented on Figure 5. Characteristic of this project is very intensive engagement of consultant organization.

## 5. CONCLUSION

From presented material we can conclude:  
 § integrated management systems is very difficult for design and implementation,

§ using top-down approach from quality goals through critical success factors we can obtain critical (key) processes, and from those all processes related with quality in wider sense,

§ for pilot organization, using concept of process management with intensive work of 13 teams, IMS project will be realized for 18 months, with 351 consultant-days and in total about 1050 man-days. That means about 1.5 days per employee,

§ total cumulative costs is estimated on 65.000 euro, that means cca 4.8 euro per employee per month,

§ expected benefit is much higher in area of cost reduction, better utilization of resources and higher satisfaction of clients,

§ using cost/benefit analyze we calculate profit after 6 months from project realization.

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