

Proper Integration for the Chemical Industry in the Arab World

Mohammed Saleh Al. Ansari¹

¹ Department of Chemical Engineering, College of Engineering, University of Bahrain, Kingdom of Bahrain

Correspondence: Mohammed Saleh Al. Ansari, Department of Chemical Engineering, College of Engineering, PO box 32038, Sukhair Campus, University of Bahrain, Kingdom of Bahrain. Tel: 973-3944-1110. E-mail: malansari@uob.edu.bh

Received: April 17, 2013 Accepted: May 9, 2013 Online Published: September 4, 2013

doi:10.5539/emr.v2n2p24

URL: <http://dx.doi.org/10.5539/emr.v2n2p24>

Abstract

Integration appears to be an extremely interesting subject for many organizations. The term integration is used to describe the full link of divisions that are located at the top of any configuration to attain proper output that would be yield from the arising effect that resulted from such integration.

In this research work, the author will base his study on the facts behind integration within organizations, analyzing specific conditions and rules that should be applied. The article focuses on the topic of integration by analyzing its past and present effects when it relates to the chemicals industry. This piece of work appraises different branches of the nature of integrated management system. Evaluation of chemical production within the Arab world are considered in this study to reach an acceptable conclusion and reviews the pitfalls that exist with current integration systems within organizations.

Integrating management systems within organizations that fit into the chemical industry category is extremely important.

Keywords: chemical industries, Arab world, process integration

1. Introduction

Integration themes are extremely interesting and are presently a modern day topic for individuals and organizations alike. Integration is given in many references as a “linking autonomous units in higher structures to attain synergistic effects.” Integration also characterized as: “the developments in which mutually self-sufficient systems are related to one another as a means to converse concurrently, but other related events of components are able to communicate mutually with one another within information systems” (Janda, 2009). According to Riman (1986), integration can further be defined as being “a sociological process of unifying elements and activities in new systems that have specific goals.” Integration shares characteristics with synergy, as Vodacek and Vodackova (2009), define as “cooperative or associate effects that are created by two or more different particles, elements, or parts of organisms-effects that are unable to be obtained by other means.” It is the interaction of multiple activities that impact labor productivity within an organization when activities are assessed for their effects (Vonacek & Vodackova, 2009). It seems strange when analyzing something for the first time to be able to achieve something that is considered to be more than a summation. However, as Vonacek & Vodackova (2009) described it is plausible within human ran systems, such as enterprises. It is considered synergy whenever a team of individuals is tuned and able to achieve complexity through collective works that are mentioned in a book (Senge, 2007).

Integration is a term that is widely utilized within the software fields. Integration is something that is known in business connections along the enterprise levels. There are a lot of consultation organizations that deal with integration on a daily basis. They present integration as a task that is easy to accomplish, when it comes to implementing it. However, even though integration is presented as a simple task, there are a lot of organizations that still have a difficult time integrating it. There are some skeptics that doubt that success can be achieved with this type of solution. Integration can be deliverable within an organization, as long as specific rules and conditions are admonished prior to its implementation. For the aim of integration of chemical plants to maximize interchange of feedstocks and utilities was worldwide practiced from the past and up to date and many workers has gone profoundly to put plants together. The idea of integration found its acceptance in many industries other than chemical and petrochemical industries but was slow in developing the integration. The eco-industrial stands

for “economic sustainable” as paramount target to achieve development. Interchanges are being implemented for chemical and industrial parks for a variety of industries that often of quite different nature and philosophies (Luis Puigjaner, 1998)

2. Integration within the Chemical Industries – Management Approach

The topic of integration again is appearing as it from past and present scopes, within the chemical industries mainly. As mentioned in various publications by multiple authors, the chemical industry is comprised of various sub-branches. The chemicals industries can be considered as being one that chemical factories standards are devised towards an integrated management method. The standard incriminates the requirements for resources such as raw materials, labor and power, procedures and manuals of operation and maintenance, employee training, quality of production, as well as management tools that can ease the integration process. Integrated management systems contain some industry standards and management systems through the vision of hierarchical processes, as given in the literature related to (Norm, 2009), the systems also concentrate on management systems for safety and occupational health, environmental management systems, and managing systems required for the safety of information. Safety management systems are important to take into consideration but with higher care in the conversion or consideration of integration, also in connection with different applications within the chemical enterprises and dependability management protocols which is a must in any applied procedures. Organizations utilize many different systems. Crisis management regarding loss prevention within organizations should also be a part of all integrated management systems within an organization. Unfortunately most of management tools within the Arab countries have become valid procedures which curb the innovation and development for the process integration according to (Jose et al., 2012).

World Wide in its different regions is making an economical and technological understanding of integration to develop regional economics. The economics and politics in this context lead to one fact that it could be used as a notion to make integration working. If this works then it will makes the losses of one or more major industries turned to be positively benefit the argument for the advantages of integration. This is a technique and policy to move forward when such action is endanger. This was the practice for five well-defined European chemical clusters. Many research works came up with conclusion that moving towards slow move of investment that might cause shutdown which is a threat factor of assured maneuvers has moved the action to the way to new synergies with actual industry and utilities.

The chemical industry, is a specific type of field that does not have a fundamental industry standard used within the current. The procedure chooses to use an easy form of integration and common standard management systems that have been explained in previous texts. Good laboratory practices are described by Norm ISO 17025 and social responsibilities in regards to different standards can be added. The chemical industry is forced to follow a plethora of notices and regulations.

While implementing an integrated management system, it is important that the organization focuses on the problems along with the dis-integration perceptions of problematic enterprises by high costs, employees, extensive administration, profitability, separate parts of the management system, lack of communication from interested individuals, terminology conflicts, inconsistent approaches to implementation, as is regarding in Pelantova, and Veber. Opinions can be obtained that these are parts of quality management systems. Conflicts arising in the links between quality, time and cost are analyzed by (Chaloupka, 2008), however (Imai, 2008) refuses these concepts of integration. By successfully building integrated management systems, there will be simplified agendas, risk anticipation and prevention, development and training equipped each of the employees, with a reduction in the amount of employees that are isolated from the group. Managers need to take this information into consideration. (Pelantova, 2011) get concern with the evaluations that is relating and concerning integrated management systems within organizations has not been finalized into practice. There are many aspects that are depended upon, which are analyzed by various disciplines. Literarily speaking, when any process of evaluations are taken into consideration to based on costs, the degrees of integration systems, the customer satisfaction and customers appreciation regarding relevant parts and the number of nonconformities and relevancy.

3. Integrated Management Systems with Respects to the History of the Chemical Industry

Chemical companies redefined their major products and revolve off minor production and services. This means that strategic decision either the management board to switch the core product to be non-core product. This occurs often to new companies fitting many such pieces together specially when feasibility study suggested product and found it not adaptable to the market. Recently has been noticed that many revolutionizes in ownership and corporate names has been noticed for specially chemical industries that it is frequently difficult to

decipher a proper report about it in the major industry databases. In the past there were examples of chemical production enterprises within the Arab world that existed early on and could not continue due to its difficulties to compete with the production cost of chemical product that recently came to the market. The chemical industry is comprised of various sub-branches, it is possible to write about every branch of the chemical industry separately. The relationships that such industry with respect to the other industries are extremely significant. For example, chemical industries are responsible for helping the textile industry with tasks that are associated with bleaching. Bleaching may obtain from another factory rather than the same chemical manufacturing firm.

The amount of investment that the organizations obtained was not the initial significance to the managers of such firm within the chemical industries. In the past, occupational safety and the moral values that each individual should ensue were tasks that earlier managers cared about the most. These managers strived to provide their employees with long term job contracts and accommodate them with higher salaries for their labors. Employees were given many different bonuses when they chose to be a part of the chemical industry, some of these benefits including personal accounts, saving schemes and loans with accommodations, medical insurance, as well as care for disabled individuals, access to a water supply, electrification, publications and so forth. The enterprises have a low turnover rate. They are considered to be the representations of leadership for current organizations that is ascertained.

The integration of management systems was managed effectively. Quality was preferred. Organizations within the Arab world could be characterized by the higher quality products that they released in comparison to other parts of the world. In addition, safety was something of a high priority. Proper changes and improvements to the workplace and the way that it was organized were provided, appropriate procedures were implemented, and personal protection for tasks being performed was provided. The technological recipes and procedures were given patents. In the past, when it came to the chemical industries, patents played a beneficial role. Some of the major patents that were administered in the past included the production of soda in the year seventeen century brought the production of man-made fiber, since thirties of last century brought forth the production of synthetic pesticides and nylon. Closed water cycles were promoted within the organizations.

There was further information released about the chemical industry after the Second World War had ended. A lot of emphasis was given to post-war productions. Less information was released from previous periods when individuals were forced to deal with more lists and utilize different types of production technologies, than information regarding life of organizations and the relationships that they had with their employees.

4. The Present State of the Chemical Industry and Integration of Management Systems

The occupational health and safety at work along with environmental protection acts have become significant within the chemical industries around the early 1970. During this time the initial negative effects on humans and the nature caused by the chemical industries was primarily proven and started to be well known. Water, air, and soil was drastically jeopardized. Accidents that occurred due to withdrawals had its danger on staff and the rest of employees of the organization. Populace and citizens in the region were also impacted. A risk analysis was necessitated in the organizations that produces chemical and even chemical related substances. This should be multifaceted when considering integration of systems and even negotiation should be based upon this notion.

Implementing preventive and corrective actions will need to follow the order to control all risks. Creative legislative instruments will need to be thoroughly put into effect. Regarding the sustainability in the process industry that verified techniques for creating sustainable operation environments. This must-have text for process industry professionals that analyzes how to considerably improve the efficiency and sustainability of process in the chemical industry practices. The process integration (PI) and optimization are always in its methodology, and industrial studies focus for industry professionals to learn practical operational solutions. Sustainability in the Process Industry is the first comprehensive work to integrate optimization and targeting tools for process design and operation. So Process Integration (PI), is a complete part of family of optimization methodologies for reducing resource or emissions intensity of the analyzed processes and total sites. As such, it is tightly related to optimization. In fact, PI and optimization complement each other by their functionality. PI sets out the strategy for designing and/or operating industrial processes

Process integration is a holistic approach to process design and operation. This would make more highlights the unity of the process. So when it come to economics then the output the governor to Process integration design tools to make over the past two decades to achieve process improvement. The increase in productivity and its enhancement, conservation in materials mass and energy resources, and reductions in the operating and capital costs of chemical processes is always a major factor for any decision.

Present influential organizations within the chemical industries have implemented an integration in which they report to legacies of pre-war founders according to the information that is provided. This includes environment, quality, and safety at the workplace. The linking of inspirations from other industrial branches, such as utilizing the chemical industry for food production or using unit operation such as drying plant to serve another neighborhood plant. Seize for example in year 2010 that how the chemical factory in the midst of the domestic channels were greatly impacted by the automotive industries. Considerable and mutual cooperation and understandings between the chemical firms and the textile production plants can be tell off in the manufacturing of artificial fibers as well as for yeilding of crops when certain environmental breakdowns take place. The issue is being able to obsolescing technological complexes. In the past, Engineers thought of utility interchange to be not economical industries except on the original Polymer site. Even there such interchanges dropped over time. As the development proceeds further now going back to the 500-MW power plant production utilities to be operated by other companies expanding upon a smaller system based on surplus generating facilities. To make it little more complicated when steam of power plant sold to desalination plant using multistage flash distillers or direct injected as saturated steam to brine heater. Looking at increasing efficiency of plant when warm water used to incubate and eventually hatch the eggs of hens production.

Current integration also faces problems when it comes to introducing new technologies with the lack of raw materials. The primary focus of domestic enterprises on foreign resources, which is primarily oil, is also necessary. Work within the chemical industry is extremely demanding, dirty, and potentially hazardous. All of these facts are worsening the conceivability of safety of employees. Therefore, integration of management systems is vital to the chemical industry.

Stressing on research activities within the domestic chemical factories necessitates to be observed always. There are many enthusiastic and organized skilled chemicals, which compensate for the handicaps within the foreign chemical organizations.

The process integration has started to become a solid subject of understanding by chemical plants. Often this includes competitors and opponents in the same field of trade makers and producers. Other times is also put together with preferred course of actioning of feedstocks and products. The dual purpose plants that comprises both cogeneration of high pressure vapor and saturated vapor for at-site use and the production of electricity for at-site and sale to others is a typical example where chemical companies are 'farming out' activities to companies specializing in such facilities. This is the typical wisdom of the process integration that mix together the supply of industrial gases that encompass nitrogen gas, oxygen, carbon dioxide and carbon monoxide and hydrogen that consistently acquired from others makers today. Even waste treatment services are being provided by municipal or private various firms in a given industrial area.

5. Conclusions

If we rely on the history then it is clearly represented by examples of chemical production enterprises within the Arab world prior to the Second World War. Surveys from different research papers (Norm, 2008) found that results in regards to integration and the field of work safety. Even looking at recent research reports could find it describes autonomous approaches, and approaches of the chemical industry from earlier in history. It is noticed from some research articles that analysis of some studies that there is disadvantages of current integration within organizations. This could be referred as it make integration a difficult method to implement. This could be seems as that leaders of enterprises need to learn how to benefit their organization and the entire environment during implementation.

Integration systems must be assess critically with process of evaluation that could be planned continuously. It is unable to be built up in different parts, as it is done in many different organizations around the world. Chemistry is a natural science that sustains integration in a direct style and behaviour. A critical mistake that was made to forget about the natural parts of the environment and only deal with technology. Breakdowns and nonconformities within the chemical industry is a confirmation of it.

Integration of systems within organizations that are a part of the chemical industry is extremely important. In many regards, individuals that were a part of the pre-war business sector understood this concept. They did not focus all of their attention on the yield only but practiced their heed about the firm workers and their neighborhoods that their organizations were nestled in. They even were forced to overcome economic crisis. Long term accomplishment for organizations be the direct result of proper integration systems.

The Arab world has quickly become an industrialized section of the world. With many natural resources being exported from the nation, it is important that integration is properly followed. One of the main resources that the Arab world provides to other countries surrounding it is oil. Utilizing proper integration will help organizations

ensure that their employees remain with the chemical industry and do not stray elsewhere. Employees and their safety are just as important, if not more important than the output of a money making product. Without proper integration the industrialization nation of the Arab world will falter.

References

- Amudsen, A. (2000). Joint management of energy and environment. *Journal of Cleaner Production*, 8(6).
- Chaloupka, J. (2012). *QFD and FMEA Practically*. Papers of the Training 2011. Pardubice: Amos Agentura.
- Galbraith, J. (1977). *Organisational Design*. Addison-Wesley, Reading, MA.
- Imai, M. (2008). *Kaizen*. Brno: Computer Press.
- Jose M. L., & Puigjaner, L. (2012). Prospective and perspective review in integrated supply chain modelling for the chemical process industry. *Current Opinion in Chemical Engineering*, 1, 430-445. <http://dx.doi.org/10.1016/j.coche.2012.09.002>
- Norm OHSAS. (2008). *Occupational Health and Safety Management Systems - Requirements with Instructions for Use*. Praha: NI.
- Pelantova, V. (2012). Good integration for the chemical industry. *Procedia Engineering*, 42, 802-807. <http://dx.doi.org/10.1016/j.proeng.2012.07.472>
- Pelantova, V., & Havlicek, J. (2011). *Integrated Management System for Education*. Liberec: Technical University of Liberec, FM, RSS.
- Puigjaner, L., & Espufia, A. (1998). Prospects for integrated management and control of total sites in the batch manufacturing industry. *Computers chem. Engng*, 22(1-2), 87-107.
- Senge, P. (2007). *The Fifth Discipline*. Praha: Management Press.
- Veber, J. (2006). *Management of Quality, Environment and Safety at Work*. Praha: Management Press.
- Vodacek, L., & Vodackova, O. (2009). *Modern Management in Theory and in Practice*. Praha: Management Press.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).