Design and Implementation of a System for the Development and Production of Cosmetics for Zorah Biocosmétiques with ISO/IEC 29110

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Case Study

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A web application with ISO/IEC 29110 has been developed for Zorah Biocosmétiques, a Montreal-based company with 20 employees. This company has been operating in the industrial field of cosmetics production for more than ten years. The company has created a line of high-end cosmetics products based on organic, ecological and fair ingredients.

This application automates the manufacturing process of Zorah Biocosmetics beauty products to prove to the Canadian Department of Health that the production process of its products complies with the health and hygiene rules established by the Department and to make a better inventory management of products. This solution uses as a main reference the Basic profile of ISO/IEC 29110.

This case study describes the methodology based on the ISO/IEC 29110. It also presents the results obtained by the utilisation of ISO/IEC 29110, the difficulties encountered and a few lessons learned. Finally, recommendations were made to Zorah Biocosmétiques to encourage the company to continue using ISO/IEC 29110 as part of his projects and also to the editors of ISO/IEC 29110 to help improve it.

The VSE and its Environment

Zorah Biocosmétiques is a small company of approximately 20 employees, based in Montreal for over 10 years. The company operates in the cosmetics industry and creates a line of high-end cosmetic products based on organic, ecological and fair ingredients.

The mission of Zorah Biocosmetics is to offer high quality cosmetic care equivalent to or better than the best products on the market using only organic and ecological ingredients. To maintain this mission, the company must prove to the Canadian government, specifically the Department of Health Canada, that the production process of beauty products manufactured at Zorah Biocosmetics respects the health and

hygiene rules established by the Ministry. Thus, the company will be able to maintain its operating license and obtain a certificate after each evaluation by agents of the department.

Starting Point

In 2018, Zorah Biocosmetics Company was looking for an Excel VBA developer to manipulate and manage data about the inventory of its products.

The set of Excel modules was developed by the boss of the company. He had developed several Excel files, each representing a module. For example, a module about raw material, a module about the creation of recipes for new products and a module about the production process. The data was not centralized and it was difficult to retrieve information.

With the system in use (e.g., Excel files), it was a headache to find real-time information that could prove to Canadian Department of Health officials that the manufactured beauty products of Zorah Biocosmetics respected the rules of health and hygiene.

In addition, given the large volume of data of the company, it has been proposed to develop a more efficient and effective solution.

The proposed solution was to develop an application, using the Basic profile of the ISO/IEC 29110 standard, with a web interface and a relational database, instead of managing the data in Excel. The company has accepted this proposal.

The Improvement Project

The company decided to develop an application to automate the production process, to access information on each ingredient used in the production of a product, and to better manage the inventory of products.

Therefore, the company would be able to provide all necessary information to the Canadian Department of Health's agents during the evaluations of the production of beauty products manufactured by Zorah Biocométiques. An evaluation is performed to verify that the production process complies with the health and hygiene rules established by the Department.

The manufacturing process is divided into several sequential stages, from the receipt of raw materials and accessories, to the filling of containers, to the packaging of the product.

This software development project had the following objectives:

- Improve the management of ingredients and accessories (e.g. pots, bottles and transport boxes)
- Create recipes for new products
- Plan the launch of production
- Make a product by running a recipe
- Manage suppliers (e.g. ingredient, jar and bottle)
- Manage the results of analyzes of the manufactured product
- Manage filling and packaging
- Estimate the ingredients and accessories of a product over a period of time.
- Do inventory of sales units and testers.
- View, with a dashboard, the productions in real time
- View in real time the stock of accessories
- Generate customized reports according to the need of the user
- Manage users of the application
- Serve as reference for the accounting of the company.

Results

With the new SYS-GIZ application, the problems are now solved and the evaluators have even congratulated Zorah Biocosmetics for developing an application internally allowing them to be effective in their evaluation.

Zorah's inventory management system is a local (intranet) web application hosted on the local server of the company. This application is available to employees on their workstation with different levels of privileges.

The SYS-GIZ application helped the company to prove to the evaluators of the Ministry of Health agents that the rules of hygiene and health are respected as well as the proportion and dosage used to manufacture each product that will be on the market.

The following deliverables, developed with the Basic profile of ISO/IEC 29110, have been delivered to the company:

- Requirements specification document
- Architecture and design document
- Requirements traceability matrix
- Procedures and test cases
- Test report
- Software User Document
- Software components

Training has been provided on the new software and about the advantages of using ISO 29110 when developing a project for small enterprises.

This project required 371 hours of work of which 46 hours (12%) were spent on rework.

Lessons Learned

If this project was to done again, as a developer, what would be done in the same way, and why:

- Obtain a strong commitment of the client in the various phases of the project which has been illustrated by its availability and active interaction with the project team.
- Document correctly the specification of the functional requirements, i.e. the needs of the customer have been well understood and well documented requirements. The availability of the client has made it possible to validate the requirements.
- The application of the two processes of ISO/IEC 29110, as a guide for carrying out the project, project management process and the implementation process of the development cycle.

If this project were to done again, as a developer, what would be done differently, and why:

- Better master the Basic profile of ISO 29110 before starting the project.
- Better understand the ISO/IEC 25000 standard, i.e. the standard used to define non-functional requirements, such as maintainability (e.g. testability, modifiability), safety, to name just that, which will undoubtedly help identify more non-functional requirements for the SYS-GIZ project.
- Better manage the changes to the requirements of the customer.

As a developer, the difficulties encountered during this project were as follows:

- Lack of an overall understanding of the Basic profile of ISO/IEC 29110. This has forced the developer to spend more time on the project.
- Inaccurate and changing functional requirements. To properly specify the functional requirements, the client's needs must be clearly understood. When the client is imprecise in the expression of his needs, this situation may cause problems.

Plans for the Future

Zorah Biocosmétiques wants to add other functionalities, such as evaluating the degree of customer satisfaction, integrating an automatic recommendation system proposing to a customer a similar product. The company is planning to make other changes, such as sending automatic email notifications when creating new users, when executing the automatic backup script, and when stock of a raw material or component is depleting.

A new version of the software will be delivered by an author of this mini case study, since he provides remote technical support. Since all project documentation is available, it is also possible for another developer to provide support to the company.

References

ISO/IEC TR 29110-5-1-2:2011 – Software engineering - Lifecycle Profiles for Very Small Entities (VSEs) – Part 5-1-2: Management and Engineering Guide – Basic Profile. International Organization for Standardization/International Electrotechnical Commission: Geneva, Switzerland.
Available at no cost from ISO at: http://standards.iso.org/ittf/PubliclyAvailableStandards

ISO/IEC 25000:2014. System and software engineering—System and Software Quality Requirements and Evaluation (SQuaRE)—Guide to SQuaRE, International Organization for Standardization

Zorah Biocosmétiques web site: https://www.zorahbiocosmetiques.com/

More information about ISO/IEC 29110 is available on the following web site:
https://profs.etsmtl.ca/claporte/English/VSE/index.html