Theoretical underpinning and development integration of the PIM system into business processes of retail network

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Abstract

In this article, the theoretical foundations of automated control are considered, the concept of complex automated systems, from types, is described. The choice of the type of PIM-system (information management system for the product), its structure and system of hierarchies is justified. The integration of the system into the company's business processes was carried out, and a system of system documentation was developed. After the system was launched, a report on its operation was created.

Keywords: Product Information Management, system PIM, distance management, automated control.

1 Introduction

Integration of product information management system can simplify work with the brand catalog, increase the efficiency of interaction between different departments of the company, reduce errors.

The present study of the automated control system is based on the following disciplines: the general theory of communication, complex systems science, automatic control theory, decision science. System analysis techniques were used in this research. System analysis requires tracking internal and external connections as much as possible. It scopes significant factors and connections to and to estimate their effects.

Goals of research of this article: theoretical underpinning, integration policy design, and launch of a PIM system. **Target of research** is the PIM system and all integration processes to corporate infrastructure, integration policy design, watching system launch processes and analysis of final results. **Scope of research:** the theoretical basis of the control system and ACS development and functionality principles.

2 Research tasks

1. Research the theoretical and methodological underpinning of integration policy design.
2. Justify the need for PIM system integration.
3. Concept formulation for the PIM system development project.
4. Delivering the PIM system to the production area, configuration PIM system to meet stakeholder's requirements.
5. Post delivering production state, developing the report system.
6. Writing the final account of the production system running results.

3 Key terminology

Management is the organizational process which provides achieve certain goals.

Control System (CS) combines all equipment and devices which provide control of an object. Automated Control System (ACS) is the CS where people are decision makers and automated equipment and devices collect, process and displays the tasks information, summaries, results and analyze data for decision-making processes.

Automated Process Control Systems are ACS which generate and implement control activity on the controlled technological object by the current level of quality standard.

Technological Subjects of Control is a combination of technological equipment and implemented instructions and standards of the technological processes.

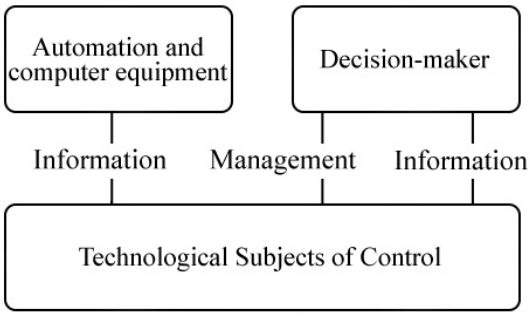

FIGURE 1 The structure of centralized APCS

We talk about Product Information Management (PIM) as APCS in the present study.

4 Overview

The criteria for optimality (efficiency) of the operation of technological objects include achieving the greatest

economic effect: reducing the time and financial costs, reducing errors, increasing the total profit.

A set of elements can be called a **System** if they have the following features: a) connections that allow connecting any two elements of the set by navigating through from element to element; b) property (purpose, function) different from the properties of individual elements of the set.

4.1 THE MAIN TASK OF QUEUING THEORY

Queuing system (model) is called the mathematical model of the system that is designed to service requirements that arrive at random time intervals, and the servicing durability in the general case is also random. *Units* are meant to be different types of queries in the present study: to import and uploading, requests from business partners active in the system, malfunction and troubleshooting alerts, to add and delete users, commodity items, group of commodity items, etc.

4.2 SYSTEM TYPES

Loss system – units which cannot find no one available appliance are loosed. Waiting system – allow waiting for any number of units that cannot be served immediately. They are collected in the query and selected to serve in order that determined in accordance with some discipline. Priority systems – arriving units have different priorities. Arriving high priority unit push out from serving devices low priority units or terminate them.

- Integrated PIM system is priority system.
- System design.
- General Systems Theory Concepts.

System structure is decomposition of the system to groups of determined connected elements, permanent on continuous processing time and provides an indication about the whole system.

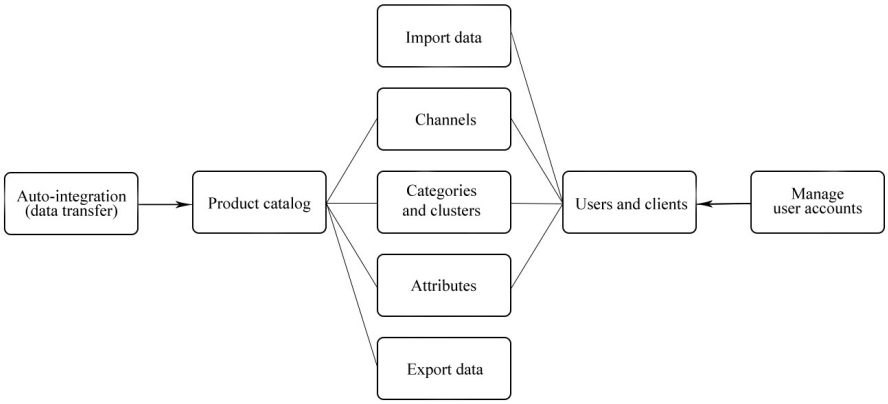

FIGURE 2 Integrated PIM system structure in the present study

The degree of system sophistication is associated with the number of recognizable parts and their interconnections. So, the degree of system *sophistication* is measured by the quantity of information of the real system design.

We can use two main concepts in the struggle with sophistication.

The first is independence. We should maximize the independence of system units to minimize sophistication in terms of that conception. It means system decomposition where high frequency dynamic of that system would contain in single units and interunit interconnections would realize low-frequency system dynamic.

Decomposition means system division to parts which are usable at some processing on that system. The simplicity of the system is an important stimulus and main idea of decomposition the system too sophisticated for analysis. The traditional method of controlling sophistication is "divide et impera" principle also called modularization.

A module is a group of system units which are described by inputs and outputs and keep solidity. To minimize complexity and sophistication of the system we should decompose it to multiple "small then the smallest" independent modules. This can meet a high level of independence by two optimization methods: increasing internal communications for each module and decrease interconnections between modules. We should try to implement a single function at a single module (high module strength) and decrease interconnections between modules by using formal parameters passing (low coupling modules).

We decided in present study to develop system with maximum modularization level. PIM system contains:

1. Goods Catalog (GC)
2. Goods Directory (GD). It provides ability to edit high level information without focus on goods detailed attributes.
3. Digital Asset Management (DAM). Independent media store: goods images, logos and brand stories, image-building media files (images, GIF and videos).
4. Batch Upload (BU). Provides an ability to import to PIM bunch of goods attributes in single large file (hundreds SKU)

So, all subsystems are independent of each other. Using of the PIM system is easy. Users can find failure alerts, view version changing and process large amount of bunch of goods.

The second conception is a **hierarchical structure**. Hierarchy is a structure with depended subordination and one-way connected relations between elements. Action in one way takes much effect than in another way.

PIM user access management system is built on hierarchical concepts.

One of the principal tasks of ACS analysis is designing of the appearance model which shows interconnect processes between elements and subsystems, the interoperability with an external environment.

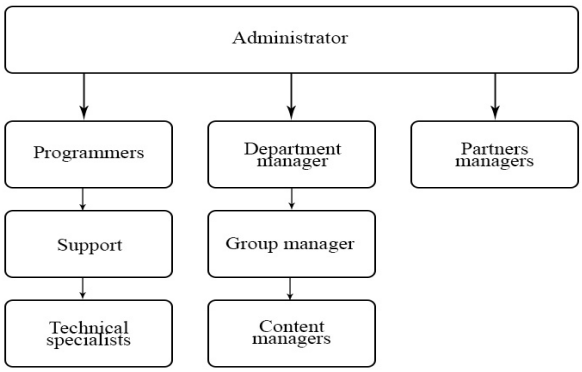

FIGURE 3 Hierarchical structure (interoperability) of the PIM system

5 Decision

PIM system management.

Management PIM system should be operable, answer correct data on command actions to access the maximum efficiency of the PIM system. A command is one of the management actions which should support system state otherwise change the system by applying concrete regulation rules.

PIM system integration.

Taber Trade Ltd. is a retail network which contains more than 230 shops. The assortment matrix of the network is ever-expanding. Near 1000 new SKU are added monthly.

Taber Trade Ltd. has a content management system (CMS). CMS meets following goals: automated daily integration to company IT infrastructure, automatic data migration from brand PIM system such as LOREAL, UNILEVER, RECKITT BENCKISER, KIMBERLY-CLARK; two-way import/export procedures, reduce human hand labor, minimize human mistake factor, data storage optimization, integration of algorithms to reduce time spending to add information, validate and keep information consistency.

First integration step (3 months) had the following tasks: configure automated data import from brand PIM systems, configure integration processes to company IT infrastructure (daily uploads and data updates), upload all data of the assortment matrix (15000 SKU), design company procedures and rules, business processes for adding new data, inserting and dropping SKU, interoperations with business partners, company managers, test data implementation procedures and uploading images from PIM system to CMS and company website, optimization of communication and storage data procedures.

After progress review and data finalization desired result was performed: all SKU information (images, characteristics, video review, articles, webinars) was added to the company website and CMS; PIM system integrated to company IT infrastructure and all company IT services; all business partners and stakeholders was added to the PIM system as users and was trained for work in PIM; detected and corrected all knowing errors and fails at PIM; integration business processes was jointly agreed upon BrandQuad Ltd. (PIM framework cloud provider) and Taber Trade Ltd; was launched the automatic informing of partners about new products in the system, about the expiration of the terms of filling, about changes in the work with the system, updates of the functionality; automated data chacking.

6 Conclusions

The result of the coordinated work and timely integration was a trial launch of an online store in September 2017 and a full launch in October 2017.

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