Universidade do Minho
Escola de Engenharia

Semana da Escola de Engenharia
October 24 - 27, 2011

PARTS CHARACTERIZATION USING REFERENCING CONCEPTS IN AN INDUSTRIAL MANUFACTURER OF MEN´S SUITS

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KEYWORDS
Generic Referencing, product data management, parts characaterization, textile industry

ABSTRACT

Parts characterization, bill of materials (BOM), routing and production resources are the fundamental information for Production Planning and Control (PPC) processes. Mass customization contribute to an increase in this type of information with which an industrial organization has to deal. To face with this challenge a methodology for parts characterization using generic referencing models is used. This methodology uses grammatical classification integrated with knowledge of the production system. An industrial case study of a company of men's suits is used as an example of application of the methodology.

INTRODUCTION

PPC systems have management processes that are based on information about parts characterization, bill of materials (BOM), routing and production resources. This information is represented in product information models that can be classified into (Scheer, 1994; Wob, 1997): direct referencing models and generic referencing models.

Models of representation of product information based on generic referencing aims to cope with new challenges such the product information management in a more efficient way. New production paradigms, such as mass customization (Pine, 1993, Gilmore and Pine, 1997) which aim at satisfying the specific needs of each customer and contribute to an increase in the information of finished products, semi-finished products and raw materials with which an industrial organization has to deal.
With these models a generic reference identifies a family of parts characterized by a set of common properties. Identifying adequate properties that characterize a family require the ability to evaluate different possible alternatives and select the best suited for each case.

METHODOLOGY OF PARTS CHARACTERIZATION

The methodology used in this work is presented in Gomes and others (Gomes et al., 2011). It is defined as a set of steps, techniques and tools to use in each phase and aims to achieve an initial solution for the parts characterization of an industrial organization, using the concepts of generic referencing. The methodology will act as a guide for the user to use the generic referencing to parts characterization.
The implementation of the various steps on the methodology phases relies on two distinct areas of expertise: grammatical classification and knowledge of the production system. The use of matrices also plays a key role in the methodology.
In the context of the generic referencing, the parts' characterization corresponds to the creation and definition of generic references, quantity and quality of the parameters associated with each one and the set of values that belong to the domain of each parameter. The methodology for supporting industrial organizations described here consists of the following set of steps (Gomes et al., 2011):

- Step 1: Collect data and information sources.
- Step 2: Data classification using the morphology of words, particularly the grammatical classification of words. There are classification alternatives using concrete noun, abstract noun, adjective and other. The option "other" includes other grammatical classifications as verb and adverb.
- Step 3: Classification of concrete nouns to production classes: Raw Material (RM), Intermediate Product (IP) and Final Product (FP).

- Step 4: Construction of the matrix generic references/generic references.
- Step 5: Construction of the matrix parameters/parameters values.
- Step 6: Construction of the matrix generic references/parameters.
- Step 7: Definition of the generic references parameters.
- Step 8: Definition of the values domain of the generic reference parameters.

INDUSTRIAL CASE STUDY

This is a case study based on an industrial company of men's suits. This company is involved in a project that aims to implement a generic referencing model for product information management and its integration with the PPC systems. The project was motivated due to a large increase in the amount of information being managed by PPC systems users. In this type of industry, the variety of products has grown due to the offer of a greater number of suits models that can be produced in various cloths, colors, sizes, with different accessories, etc., resulting from the use of a variety of raw materials and operations. In the region where this study was done the difficulty in managing the large volume of information for this type of industry is recognized.
The table 1 shows a summary of applying the methodology. After completion of this step 8, it is defined a solution to parts characterization using the concepts of generic referencing models.

Table 1: Generic references, parameters and their values

Generic Reference	Parameter	Parameter Values
Cloth	Quality	48070, 49070, 51200, 52988, 630800
	Colour	Blue, Black, Grey, White, Brown, Red
Lining	Type	Plain01, Checked01, Stripe01, Stripe02
	Composition	100%Acetate, 100%Woll, 100%Cotton
	Colour	Black, White
Zipper	Model	Invisible, Injected, Spiral
	Colour	Blue, Black, Grey, White, Brown, Red
	Lenght	16cm, 17cm, 18cm, 19cm, 20cm, 21cm
Label	Model	Card 7x3cm, Card 8x3cm, Card 9x4cm
	Brand	B1, B2, B3, B4, B5
Suit	Quality	48070, 49070, 51200, 52988, 630800
	Colour	Blue, Black, Grey, White, Brown, Red
	Size jacket	40, 42, 44, 46, 48, 50, 52, 54, 56, 58
	Size trousers	36, 38, 40, 42, 44, 46, 48, 50, 52, 54
	Brand	B1, B2, B3, B4, B5

CONCLUSIONS AND FUTURE WORK

The decrease on the number of records in the representation of production information using generic referencing models is highlighted in several studies. However, due to the high capacity and flexibility of representation in these models, emerge a large number of different alternatives of parts' characterization, operations characterization, BOMs definition and routings. The methodology used in this work explores fundamental concepts of generic referencing models - generic reference, parameter and parameter value - and define a set of steps and tools to be used in obtaining a solution to characterize parts of industrial organization. The description of a case study in an industrial manufacturer of men's suits allowed to present a solution for the parts characterization.
A deeper study will be done to compare the number of information records in the different representation alternatives in generic referencing models.

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AUTHORS' BIOGRAPHIES

JOÃO P. GOMES was born in Barcelos, Portugal and went to the University of Minho, where he studied Industrial Management and Engineering and obtained his degree in 2005. He worked two years in consulting and software before moving in 2007 to the University of Minho where he is researcher and PhD Student in the field of Production Planning and Control (PPC) systems and integration with generic referencing models. His e-mail address is: jpgomes@dps.uminho.pt.