Impacts of Software Deployment in the Coffee Agribusiness of Brazil

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Abstract. The process of software deployment into an organization is a complex process that encompasses various aspects. Studies on the impact of software systems deployment in the customer's environment in the medium and long terms are hardly found, specially when the deployment of the software product and the introduction of data processing into the organization happen at the same time. Nevertheless the client's perception goes beyond the specific moment at which the software was installed. User's and customer's satisfaction can only be evaluated in the long term taking into account the satisfaction with the product use and with its impact on business. This paper describes an empirical study of the introduction of data processing into the coffee agribusiness in Brazil. The paper uses cluster analysis to group 0-1 variables. Theses variables describe the impacts of data processing on the coffee agribusiness in the state of Minas Gerais, one of the main Brazilian coffee producers. Influences on employment, employee and enterprise structure are examined. Some commonly used procedures as well as main changes at corporation and individual level are detected.

1 Introduction

The introduction of data processing into an organization together with software deployment is a complex process that encompasses various aspects. In the latest years an interest has arisen for research related to the software deployment in organizations. However, the interest is many times restricted to technical aspects or aspects related to infrastructure as we can see in [1] [2] [3]. Few papers cover the evaluation of customer's satisfaction like [4] [5] [6] [7]. Studies on the impacts of the introduction of data processing and software deployment in the medium and long terms are hardly found. However, customer's perception of a software, following [4], goes beyond the

F. Bomarius and S. Komi-Sirviö (Eds.): PROFES 2005, LNCS 3547, pp. 257–271, 2005.

specific moment at which the software was installed and the problems occurred. Customer's satisfaction which is one of the main elements of software validation and a important measure of success when introducing data processing in a organization, can only be evaluated in the long term. User's and customer's satisfaction with the product has to be evaluated and its impact on business has to be considered [8] [6] [9].

Nowadays, the use of information technology is compelling. However, in general, the introduction of data processing into organizations is a long, hard and not much studied process [10]. In this paper we study the impacts of the introduction of data processing into the coffee agribusiness in Brazil, examining the results of the first software deployments in a group of companies in this area..

The coffee worldwide agribusiness chain moves various billions of dollars every year. According to Love [11] world coffee exports in 1998/1999 reached US$11 billion, off 10% from 1997/1998, after rising to US$ 14 billion in 1996/1997. Brazil is the world's largest coffee producer [11]. In accordance with the results mentioned in [11], Brazil accounted for 33%, 24% and 27% of the world's coffee crop corresponding respectively to the three periods above. More recent data confirms this figures. Brazil's contribution in the world global production from 1999/2000 to 2001/2002 rises from 23% to 28% [12].

Coffee production is, therefore, responsible for a significant amount of Brazilian exports, for the creation of millions of jobs and for setting down labor in the rural zones. It occupies an important position in the Brazilian economy. Estimates indicate that the coffee industry is responsible for the employment of 4 million people in production and 10 million people, if we take other segments into account [13].

After 1990, with the discontinuance of the International Coffee Agreement, which regulated the prices all over the world, the Brazilian Government called off the subsidy to the coffee agribusiness, submitting the organizations to market rules. As a consequence, investments in data processing slowly begun. According to the Science and Technology Ministry [14], today 9% of Brazilian software companies develop products for the agribusiness sector.

This paper examines the social and economic consequences of software deployment and the use of data processing in the Brazilian coffee industry. The state of Minas Gerais was chosen because it concentrates 50% of the Brazilian coffee production. The research began in 1990 based on information obtained from a questionnaire answered by 10 coffee producers, 21 cooperatives, 34 roasting and grinding companies and 2 producers of soluble coffee.

Section 2 considers some general aspects of software engineering and the impacts of software development on organizations. Section 3 describes the methodology used in the research, mentioning the main points covered by the questionnaire and giving details of the use of cluster analysis. Section 4 mentions the main variables and the results obtained using this technique and section 5 presents the conclusions.

2 Impacts of Software Deployment at Organizational Level

Software Engineering describes processes, methods, techniques and procedures that lead to the development of high quality software. Much has been written and said