

**THE APPLICATION OF SYSTEM DYNAMICS IN THE DESIGN AND SIMULATION OF A TQM
MODEL AND IN THE IDENTIFICATION
OF INDICATORS OF A SUSTAINABILITY BALANCED SCORECARD TO AID STRATEGIC
AND OPERATIONAL MANAGEMENT**

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The application of System Dynamics theory may help to identify the key variables that characterise a business and, with the help of specific software (iGrafx Process, Powersim, Vensim) also allow the simulation of models that identify, represent and simulate the dynamics involving the variables identified. These models can represent the variables in terms of cause and effect within a global approach to business activities. Moreover, the models can contribute, via the dynamic simulation of variables, to the identification of areas for improvement and spot potential errors before they arise in business management committed to Tqm and to eco-efficiency of resources. The aim of this work is to identify, by means of a case study, the necessary steps to produce a model and the key factors that determine the application of sustainability in business strategies. In order to achieve this, statistics generated by a simulation of processes in a case study (confectionery industry and bakeries) were utilized. The simulation data were able to provide precise figures regarding: the duration of the production cycle analysed, the resources used, the emissions, costs, bottlenecks, problem areas and also simplified the drafting of a Sustainable Balanced Scorecard. The Sustainable Balanced Scorecard was devised as a balanced “set” of information that “translates strategy into measures” and is able to “unequivocally convey strategy to the whole of an organization” (Kaplan & Norton). The Sustainable Balanced Scorecard drawn up helps management to monitor key variables and to make any adjustments to strategy required in order to accomplish the goals set.