

GREEN BPM

Sustainable Production Patterns

The Procedure Business Model was taken into account for the Horus “green catalogue”, because the abstraction of solutions to turn processes greener could be beneficial for the green business management approaches. By assigning measures, risks, indicators of improvement, costs, resources, etc., the procedure models can be expanded to a complete business process model, interfaces or dependencies between individual processes can be detected and strategies for green business process improvement can be formulated. Thus, the designed procedure models were considered of high relevance because they represent the linkage of the assignments of the Horus software that, in the end, provides an overview of the system, relationships, interactions and influences that occur within the business models to apply the necessary measures and modifications. The idea of establishing “green” process models arises from the authors Nowak et al (2011, p. 1-10) contribution. In their paper, the researchers propose patterns which show solutions for green business process design from a business perspective. In order to provide a broad application of this patterns, the authors described them independently from concrete modelling languages. Nowak et al. (2011, p.1) affirm that the management of green business process deals with the optimization of the four common factors quality, time, costs and flexibility, plus a new dimension: the sustainability dimension. This last dimension covers a variety of aspects like energy consumption, water consumption, or production waste incurring during operation processes and activities. In their article, the authors present forms of green business process design based on the frequently occurring forms. The idea was the implicit application of the patterns to provide sustainable products or services by turning the internal business operations “greener”. The model designs presented by the researchers span a total of eight models. However, only three of them were chosen and designed as Procedure Models. A fourth procedure model arises from the circular economy concepts introduced by the Ellen McArthur Foundation reports and investigations.

Green compensation procedure models

This model was introduced by Nowak et al. (2011, p.3) as a possible solution for organisations of which all or some of the processes could be difficult to redesign or restructure. When this scenario happens, it is necessary to evaluate a sustainable compensation activity to balance (at least partially) the environmental impact caused by the conventional operations. The examples proposed by the authors for this model type were economic donation for environmental organisations and sustainability programs.

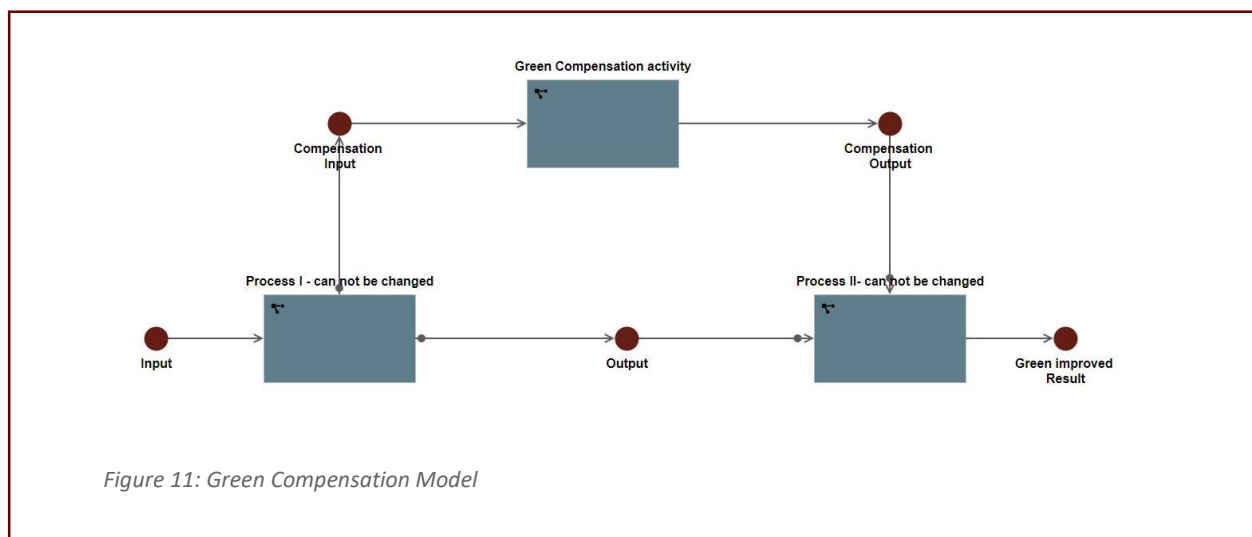
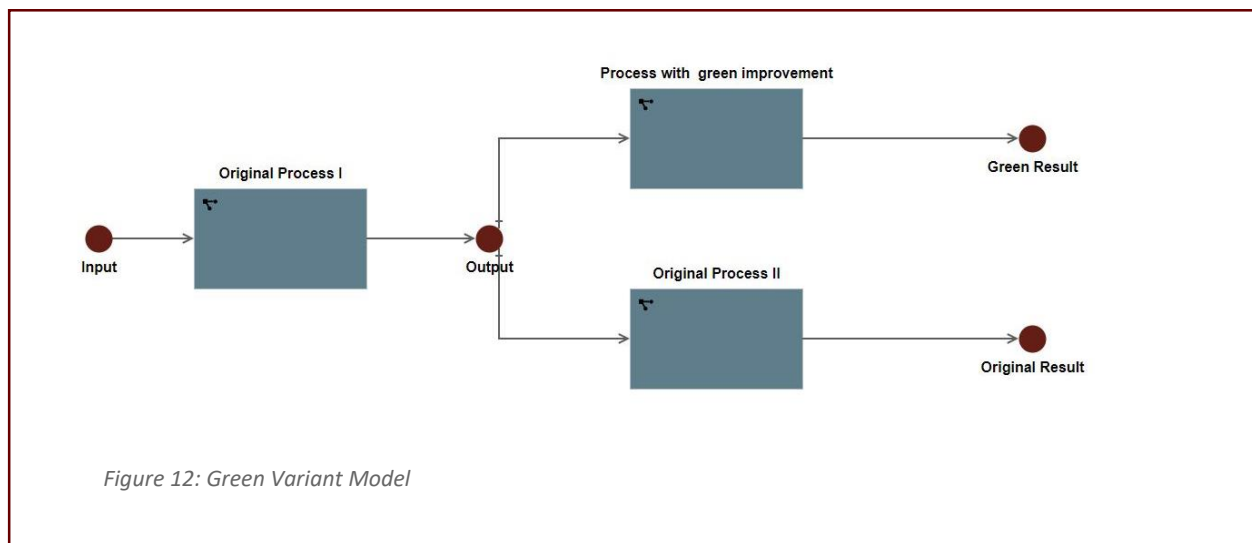


Figure 11: Green Compensation Model

Green variant procedure models

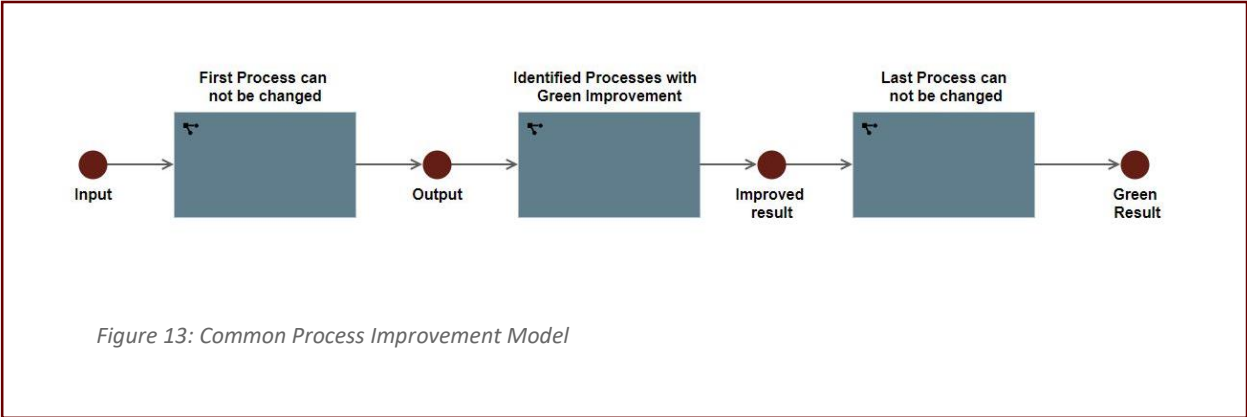
The next model type is the Green Variant Procedure Model. The authors Nowak et al. (2011, p. 4) explain that one of the disadvantages of going green is a matter of financial and/or customer perspective. An organisation may not be able to change their process operations without altering their costs or changing their internal structure; as a consequence, this change could implicate increments in product prices and less acceptance from the market. Therefore, the authors propose to start embarking on a green path through offering an alternative “green product” by conducting a business process variant that entails less negative environmental impact than the original one.



One example proposed by the authors was the change of packaging. A green variant is about the offer of products of which the process operations involve environmentally friendly activities; thus, if the process implies the use of renewable energies, the reduction of material amount, and, among others, the reduction of CO₂ emissions, among others, it can be seen as a green variant.

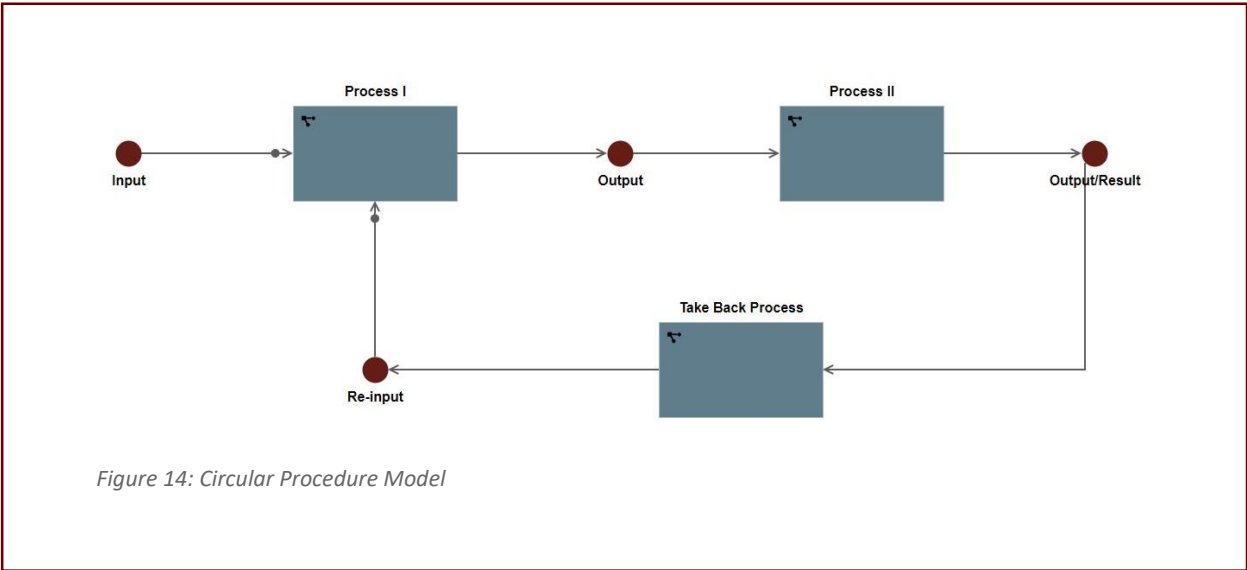
Common process improvement procedure model

This model is a mirror of the BPM practices. As a solution, Nowak et al. (2011, p.5) proposes the identification of potential processes or activities to be optimised based on the key performance or key environmental indicators, and the investigation of their environmental impact to compare them with their goals and strategies. The identification of processes implies a minimization of steps to reach a goal or avoiding those activities that involve a high damage for the environment.



Circular procedure models

The circular procedure model represents an approach that aims to maximise the usefulness of products, components and materials across the entire lifecycle. The main idea is the reincorporation of the materials in the supply chain. These business models are oriented towards a more efficient use of resources. From their conceptual design throughout the entire life cycle of the product, they are based on the exploration and development of any possible recirculation of components and materials and the reduction or elimination of waste. The circularity could be seen in terms of materials, water and energy recovery, product lifecycle extension and shared platforms.



It is important to mention that depending on the business process, relations exist among patterns. The patterns help for the recognition of a possible solution and their application should help the optimisation of regular business processes while considering ecological aspects. The main purpose for the design of this “green catalogue” was to provide the basic requirements of sustainable business processes and offer the reader a holistic vision on them. This green concept can be used as a basis for the design and modelling of operational processes, but it is not a rigid framework. Elements can be added, changed or even not taken into account.

Literatur

Nowak, A. Leymann, F. Schleicher, D. Schumm, D. Wagner, S. (2011). Green Business Process Patterns. IAAS Institute of Architecture of Application Systems- University of Stuttgart. Stuttgart, Germany, p. 1-10.

Ellen McArthur Foundation (2018). Circular Consumer Electronics: an initial exploration, p. 5.