Related Works

[1] Extending a Business Process Modeling Tool with Process Configuration Facilities: The Provop Demonstrator
Manfred Reichert, Steve Rechtenbach, Alena Hallerbach, and Thomas Bauer

- This tool demonstration presents an extension of the ARIS Business Architect in order to better cope with the high variability of business process models in practice. This extension is based on our Provop framework which provides sophisticated support for configuring and managing large collections of process variants.
- Provop provides an operational approach for variant configuration e.g. a concrete process variant can be configured out of a predefined master process by applying a set of high-level change patterns to it. Thereby, contextual information is utilized for enabling (semi-)automated variant configuration.
- For describing corresponding model adaptations, Provop supports well-defined change patterns: INSERT / DELETE / MOVE process fragment and MODIFY process element attribute.
- In Provop a base process may be associated with adjustment points that correspond to the entries or exits of activities and connector nodes. This enables designers of process adaptations to refer to specific model fragments. Using explicit adjustment points we can restrict the regions of the base process to which adaptations may be applied when configuring a variant.
- However, the authors didn't design a meta-model that will do context level analysis and hence, deploy a relevant process model at run-time using some querying mechanism.

[2] Dynamic Adaptation of Fragment-based and Context-aware Business Processes
Antonio Bucchiarone, Annapaola Marconi, Marco Pistore and Heorhi Raik

It proposes a comprehensive framework for adaptivity of service-based applications, which provides a set of adaptation mechanisms that, combined through adaptation strategies, are able to solve complex adaptation problems. An implementation of the proposed solution is presented and evaluated on a real-world scenario from the logistics domain.

[3] Enabling Adaptation of Pervasive Flows: Built-in Contextual Adaptation
Annapaola Marconi, Marco Pistore, Adina Sirbu, Frank Leymann

- It proposes a set of built-in adaptation modeling constructs that can be useful to add dynamicity and flexibility to flow models.
- They include conditional branches within flows with context conditions as guard conditions; context handlers that allow to automatically react to context conditions violation during the execution of the flow; constructs that allow to specify a set of alternative paths, each handling a specific execution context.
- For each built-in adaptation construct we provide a BPMN-like graphical representation and define a BPEL extension, with a clear syntax and operational semantics that can be used to specify and execute Adaptable Pervasive Flows.

[4] Dynamic and context-aware process adaptation
Michael Adams, Arthur ter Hofstede, Nick Russell and Wil van der Aalst

Using a set of principles derived from Activity Theory, a system has been implemented, using a Service Oriented Architecture that provides support for dynamic and extensible " flexibility, evolution and exception handling in business processes, based on accepted ideas of how people actually perform their work tasks. The resulting system, called the Worklet Service, makes available all of the benefits offered by Process Aware Information Systems to a wider range of organizational environments.

[5] Dynamic Adaptation of Workflow Based Service Compositions
Heiko Pfeffer, David Linner, and Stephan Steglich

It presents the modification of abstract service composition plans, extending service compositions' dynamicity from late binding of service implementations to a dynamic reconfiguration of the service composition structure itself.

However, to the best of my knowledge, there exist no extensions to BPMN that allow modeling a process model with the requirements given in the manufacturing domain, in other words, for modeling a production process.

Several approaches have been investigated in recent years to support the context-aware service-based systems. Unfortunately enough, despite the considerable effort dedicated to tackling this problem, we are still far from effective solutions.

Most adaptation approaches require to analyze all the possible adaptation cases at design-time, and to embed the corresponding recovery activities in the system model [3]; they can hardly be used in dynamic settings, where adaptation cases are too many, and recovery activities cannot be defined at design time.

Dynamic adaptation approaches, where adaptation activities are automatically derived at run-time on the basis of the current execution environment and of the specific adaptation need, try to solve these limitations. Most of these approaches [1], [2], [5] and [4] however, have a limited scope and deal with local forms of adaptation.

N.B: I will discuss these 4 citations including few related works mentioned in your CIRP paper in my report in full details