## Related Work regarding AI applications in the Product Creation Process

Application of AI for engineering and product creation has been studied in previous reviews. In our previous study [2], we categorized the related work based on their depth of coverage in AI as well as in PC. Based on PC, we distinguished the related work as publications that consider several cycles or cross-cycle, selected cycle, selected process, and selected activities. For all publications that only indirectly addressed PC, we categorized them as not in focus. Similarly for AI, we categorized the publications as cross-branch, selected AI branches, selected AI tasks, selected approaches and not in focus. More information about the categorization can be found in our previous work [2]. Table 1 presents the current assessment of the related work.

The summary of findings indicates that a significant portion of related work focuses on specific PC activities. For instance, TSANG AND LEE conducted an SLR to explore the role of AI in scope of industrial design [37]; while XU ET AL. addressed the significance of fault diagnosis and presented a data-driven approach for studying fault data in vast datasets [42]. Studies also focus on a wider scope in product creation domain but lack similar focus on AI. SHABESTRI ET AL. [34] presented a survey of data mining and machine learning applications in early product planning and development. In essence, while related works offer valuable insights into application of AI in various PC cycles, none comprehensively covers the entirety of PC processes and a wide scope of AI approaches. This research distinguishes itself from our prior study by delving deeper into the utilization of AI in the PC domain. While the previous study provided a comprehensive overview, this research aims to provide a more detailed analysis, identifying various problem areas in the PC process and highlighting the specific techniques and methods employed in them.

**Table 1.** Categorization of existing literature (extended from BERNIJAZOV ET AL. [2]).

| **Focus** | | **Product Creation Focus** | | | | |
|---|---|---|---|---|---|---|
| | | **Not in focus for PC** | **Selected Activities** | **Selected Processes** | **Selected PC cycles** | **Cross Cycle** |
| **AI Focus** | **Not in focus for AI** | | [7, 15, 21, 24, 27, 25] | | | |
| | **Selected Approaches** | [18]; [32]; [31] | | | [12]; [23] | |
| | **Selected AI Tasks** | | [19]; [30] | [39]; [43] | [13] | [1]; [22]; [6] |
| | **Selected AI branches** | | [3]; [5]; [11]; [28]; [35]; [42]; [45]; [44] | [9]; [14]; [36]; | | [4]; [20]; [29]; [34]; [38]; [40]; |
| | **Cross-Branch** | | [16]; [33]; [41] | | [37]; [8]; [10]; [17]; [26] | [2], **Current Work** |

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