

Business Transformation Projects-Polymathics, Artificial Intelligence, and Patterns (PAIP)

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This chapter presents how to design Polymathic Artificial Intelligence (AI) patterns and how to use them in the Design Principles phase(s) (PAIP). AI-based Patterns (AIbP) are designed, architected, and supported by an in-house Polymathic Generic Learning Process(es) (simply Learning). Learning is transcendent to any transformation domain and AI topic. The transcendent PAIP also uses pattern-based interfaces to support all AI (and related technology) sub-domains, like Data Sciences (DS), Machine Learning (ML), Deep Learning (DL), Operations Research (OR), Qualitative/Quantitative methods, and others. The PAIP uses existing author's research works and a transformation framework that is specialized in Enterprise Transformation Projects (simply Project) (Trad, 2024a). Knowing that Projects have eXtreme High Failure Rates (XHFR); and AI makes it even more complex. PAIP standardized access to AI operations, supports operational activities for the enterprise (simply Entity). Such operations' integrity is supported by the Applied Holistic Mathematical Model (AHMM) for AI (AHMM4AI), which is the product of research in the domains of AI, business engineering, organizational engineering, information technology, and applied mathematics. PAIP applies Polymathics, which is interdisciplinary and is founded on the Polymathic Enterprise MetaModel (PEMM).

Keywords: AI, Learning Processes, Patterns, Design Principles, Enterprise Architecture, Business Transformation Framework, Ratings/Weightings Concepts, Polymathics, Enterprise Agile Methods, Organizational Engineering, Mathematical Models, Critical Success Factors, and Performance Indicators.

INTRODUCTION

The PAIP uses a cross-functional and mixed research approach that is supported by a Heuristic Decision Tree (HDT) (Trad & Kalpić, 2019a; Trad, 2019a). The PAIP supports: 1) Empirical Decision-Making System (DMS) and Knowledge Management System (KMS); 2) Action Research (AR) structure; 3) AI-interfacing; 4) Standardised input-output for AI; 5) The integration with EA, Design principles and existing methodologies; 6) Upstreaming of the Entity's knowledge and experiences; 6) A framework for a successful finalization of Projects, PAIPD(P), and AI-modules' integration; 7) Uses the IHI Methodology, Domain, and Technology Common Artefacts Standard (MDTCAS) that is based on EA; and 8) The Management Systems Factor (FMS).

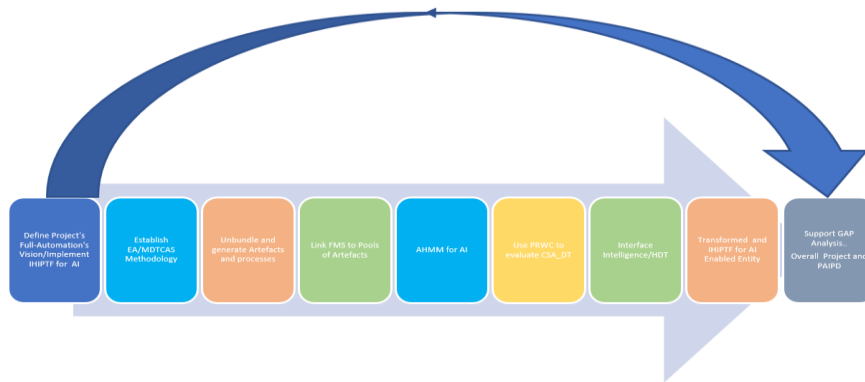


Figure 1. IHIPTF sequence of phases.

PAIP contains sets of patterns and design principles that are a new part of the author's Research and Development Project (RDP) and are a linear continuation of his previous research works, which have the aim of delivering an In-House Implemented (IHI) Transformation Framework (IHITF), as shown in Figure 1. The Polymathic Rating-Weighting Concept (PRWC) uses the FMS that includes: Critical Success Areas (CSA), Critical Success Factors (CSF), Key Performance Indicators (KPI), VARiables (VAR) used to interface Information and Communication Systems (ICS) and DMS. The IHIPTF interfaces with the PRWC, which is based on linking and evaluating sets of CSAs, CSFs, KPIs, and VARs (simply Factors). PAIP uses the AR-based Learning Process (ARbLP), which can learn and persist Project's and operations' experiences.

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