

**A
Dissertation
On
Configuring Situational
Specific methods**

Submitted in fulfillment of the requirements of the degree of

**Doctor of Philosophy
(Computer Engineering)**

By

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DECLARATION

I, Rinky Dwivedi, Ph.D. student (roll no. 07/Ph.D./CoE/2009), hereby declare that the thesis entitled “*Configuring Situational Specific Methods*” which is being submitted for the award of the degree of Doctor of Philosophy in Computer Engineering, is a record of bonafide research work carried out by me in the Department of Computer Engineering, Delhi Technological University.

I further declare that the work presented in the thesis had not been submitted to any University or Institution for any degree or diploma.

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DEDICATED TO MY Lovely Kids

Aryan & Jeanie

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ABSTRACT

Method engineering models and techniques have been extensively used for turning traditional methods into project-specific methods. However, it is increasingly being recognized that there exists a ‘dynamic’ and ‘light-weight’ methodology as well. These methodologies are popularly addressed as an agile methodology. Agile methodologies are gaining importance in many organisations.

The thesis addresses the issue of providing project-specific methods for both traditional paradigm and agile paradigm. The solution starts by providing a decision support system that helps to predict the appropriate methodological model for the current project. The Decision support system based on the defined the set of weighted project characteristics along with the project-specific input metrics for these project characteristics.

Further, thesis move towards the method configuration process for providing project-specific methods for both traditional paradigm and agile paradigm. The proposed method configuration process is analogous to system configuration. The system configuration is based on the construction of a ‘configurable system model’ that represents the essential system concepts and the interrelationship between these. Similarly, method configuration processes based on ‘configurable methods’ having as *essentiality* attribute.

The process starts by developing a configurable Metamodel capable enough to model the concepts of the configurable method. The configurable Metamodel is an instantiation of decisional Metamodel that is an instantiation of generic Metamodel. Therefore, the proposed Metamodel is an instantiation of the generic model.

Now just as the system configuration process yields a family of configured methods so also the method configuration process produces a family of methods. Further, the process was validated with the help of case studies in different domains.

PUBLICATIONS FROM THE THESIS

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1. **Dwivedi, R.** and Gupta, D. (2015). The Agile Method Engineering: Applying fuzzy logic for evaluating and configuring agile methods in practice. *In International Journal of Computer Aided and Engineering Technology*. (In Press).

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LIST OF ABBREVIATIONS

ArCME	Architectural Centric Method Engineering
AME	Agile Method Engineering
AOSD	Aspect Oriented Software Development
ASD	Adaptive Software Development
ATC	Air Traffic Control
BPM	Business Process Model
CAME	Computer Aided Method Engineering
CASE	Computer Aided Software Engineering
CD	Class Diagram
CM	Configurable Meta Model
CMC	Configurable Method Component
CMP	Configured Method Part
CoP	Community of Practice
CP	Configuration Package
CT	Configuration Template
Dep	Dependencies
DFD	Data Flow Diagram

DM	Decisional Metamodel
DSB	Development Sprint Backlog
DSDM	Dynamic System Development Method
ER	Entity-Relationship
ERconf	ER-Configured
FDD	Feature Driven Development
FLC	Fuzzy Logic Controller
GOPRR	Graph Object Property Role Relationship
IEEE	International Institute of Electrical and Electronics Engineers
IS	Information System
ISD	Information System Development
ISDM	Information System Development Method
JAD	Joint Application Development
MAD	Mobile Application Development
MAP	Method Application
MC	Method Configuration
MCP	Method Configurable Part
ME	Method Engineering
MERU	Method Engineering Using Rules

MIA	Method Intension Architecture
MLF	Life Cycle of Method
MMC	Method for Method Configuration
MMT	Method Management Tool
MN	Method Nature
MRS	Method Requirement Specification
MRSC	Method Requirement Specification Component
MTP	Method Type
MVM	Method View Model
NCM	Number of Coupled Modules
OMT	Object Modelling Technique
OOA	Object-Oriented Analysis
OPF	OPEN Process Framework
OPRR	Object Property Role Relationship
OSB	Object Specification Base
PB	Product Backlog
PMSB	Product Management Sprint Backlog
SME	Situational Method Engineering
UCD	Use Case Diagram

UML Unified Modelling Language

UMLconf UML-Configured

WPD Work Product Descriptor

XP Extreme Programming

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