

## Model Driven Architecture – Current Prospect

Renu Sharma

*Asst. Professor, DAV College, Amritsar  
renusharma1978@yahoo.com*

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**Abstract:-** Model Driven Architecture has been widely used in many application areas of Computer Science, for the solution of cross-platform interoperability, scalability, middleware, security, ontologies etc. It is a systematic development approach for software development. MDA has a huge success history on many application areas. This paper emphasis on the relevance of MDA on even upcoming technologies like IoT, Big Data, No SQL, Intelligence to provide scalability and interoperability.

Key-words: MDA, UML, CORBA, IoT .

### Introduction

Model Driven Architecture is developed by Object Management Group. MDA is an approach to software design, development and implementation spearheaded by the OMG [1]. MDA provides guidelines for structuring software specifications that are expressed as models. MDA isolates business and application rationale from fundamental stage innovation. Stage free models of an application or coordinated framework's business usefulness and conduct, fabricated utilizing UML and the other related OMG demonstrating measures, can be acknowledged through the MDA on for all intents and purposes any stage, open or restrictive, including Web Services, .NET, CORBA R, J2EE, and others. These stage free models report the business usefulness and conduct of an application separate from the innovation explicit code that actualizes it, protecting the center of the application from innovation and its tenacious stir cycle while empowering interoperability both inside and across stage limits. No longer attached to one another, the business and specialized parts of an application or incorporated framework can each advance at its own pace - business rationale reacting to business need, and innovation exploiting new improvements - as the business requires. MDA isolates business and application rationale from basic stage innovation[2]. Stage free models of an application or incorporated framework's business usefulness and conduct, manufactured utilizing UML and the other related OMG demonstrating principles, can be acknowledged through the MDA on for all intents and purposes any stage, open or exclusive, including Web Services, .NET, CORBA R, J2EE, and others. These stage autonomous models record the business usefulness and conduct of an application separate from the innovation explicit code that actualizes it, protecting the center of the application from innovation and its persistent agitate cycle while empowering interoperability both inside and across stage limits[3]. No longer attached to one another, the business and specialized parts of an application or coordinated framework can each advance at its own pace - business rationale reacting to business need, and innovation exploiting new improvements - as the business requires. In late 2000, OMG individuals initially surveyed the report entitled "Model Driven Architecture" and chose to shape a design group to create an increasingly formal articulation of the MDA. This formal yet at the same time inadequate meaning of the MDA was set out in the 2001 report "Model Driven Architecture - A Technical Perspective", by the OMG Architecture Board MDA Drafting Team. Casted a ballot by individuals in September, 2001, to be the gathering's base design, the MDA was quickly utilized by numerous Domain Task Forces to characterize and receive guidelines on different middleware stages. In mid-2014, individuals embraced the modified "MDA Guide Revision 2.0".

Model Driven Architecture is a layered architecture comprising of: (i) Component Independent Model (CIM) (ii) Platform Independent Model (PIM) (iii) Platform Specific Model (PSM) (iv) Code as depicted in Fig 1.[4][5]

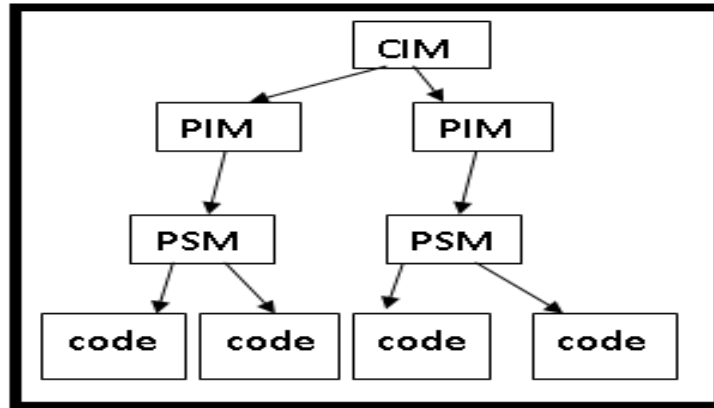


Fig 1. Layered model of MDA

**SDLC of Model Driven Architecture**

- In the prerequisites organize requirements, the necessities are evoked and portrayed in an casual way.
- Then more formalized necessities arrange, the prerequisites record is halfway formalized, yielding a calculation autonomous model (CIM). Like the MDA, the CIM is a framework particular from the perspective of the space master. Since SDL-MDD is coordinated towards the omnipresent registering space, we determine message situations with MSC on various degrees of granularity. This particular can be followed all through all models of resulting advancement organizes, and be approved against situations that are created by the SDL model debugger[6].
- In the stage autonomous structure (PID) arrange, the stage free model1 (PIM) is determined, utilizing SDL as structure language. It contains both the platform independent structure of the product framework, and the stage autonomous conduct. The consequence of this stage is a practically complete[7].

Complete process of developing a software is described as in Fig 2. Tools used at each levels are given. Depending upon area of application various types of tools can be used. In the figure only limited tools are described[8][9].

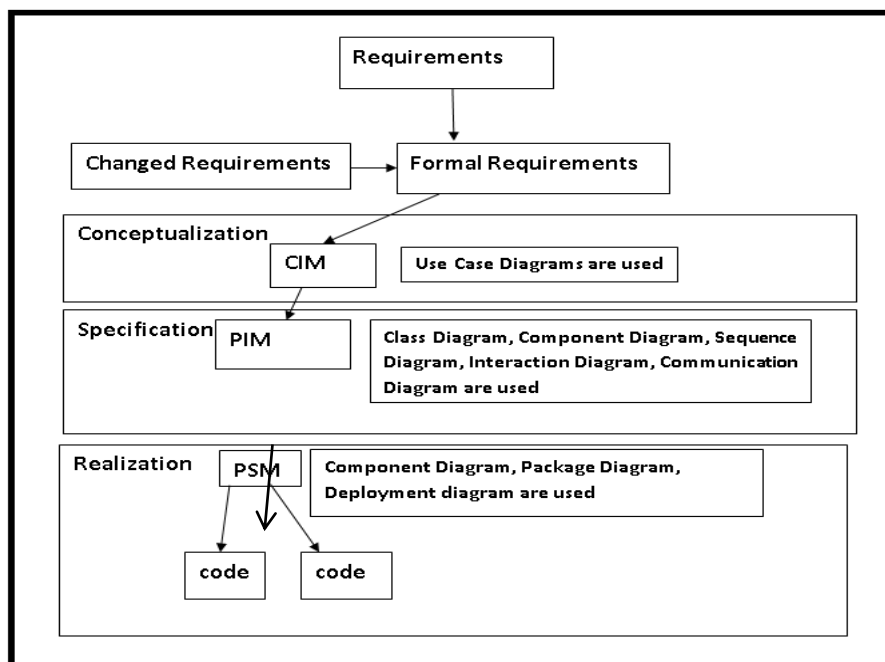


Fig 2. SDLC using MDA[10]

### Application Areas of Model Driven Architecture

MDA model can be applied to wide variety of applications like: (i) Data Warehouse [2] (ii) Business Intelligence[4] (iii) No SQL Database (iv) Mobile Applications (v) IoT Security list is quite long. OMG group has listed good number of success stories on their site[1]. This model is quite helpful in many diverse problem domains. Literature has suggested many solution domains using this approach. In this paper different directions are covered, for which solutions are given using MDA.

### Solution Domains covered in literature using MDA

OMG group has listed a long list of success stories on their site. As depicted in Fig 3. This a list given by group.


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- Looking Glass Networks
  - U.S. Government Intelligence Agency
  - The Open System Architecture for Condition Based Monitoring (OSA-CBM) Project
  - CGI
  - BankHOST
  - E-SoftSys
  - Magnet Communications, Inc.
  - Credit Suisse
  - Siemens Transportation Systems
  - National Cancer Institute
  - PTC PSA Peugeot Citroen
  - Model Driven Semantic Interoperability in the Financial Industry
  - ABB Research Center
  - ff-eCommerce
  - Swisslog Software AG
  - UNext
  - Postgirot Bank AB
  - Austrian Railways
  - National Services Industries
  - M1 Global Solutions
  - ObjectSecurity and Fraunhofer FOKUS: AD4 Virtual Airspace Management System
  - PTC Alstom
  - SWFTS SysML MBSE ROI
  - Lockheed Martin
  - Swedish Parliament
  - Deutsche Bank Bauspar AG
  - Carter Ground Fueling Ltd.
  - Gothaer Versicherungen
  - Danzas Group
  - How CodeGenie worked for AMS
  - DaimlerChrysler
  - Cube Model: MDA Meets Open Source
  - PTC CIRA
  - RemedyIT's R2CORBA for CARMA, an array of radio telescopes

Fig. 3 [1] Success Stories of MDA listed by OMG

In spite of being this model has come in starting of this century, but this model is still useful in recent applications too from wireless sensor networks till IoT. This model has its applications. In Table I, current application areas are being listed where MDA is used as a solution.

Table I Solutions Provided using MDA

<i>Application Area</i>	<i>Available Literature</i>	<i>Solution Provided For</i>
DBMS	In 2013, A. Sharma et al. [1]	No SQL Data Warehouse
Business Intelligence	In 2014, A. Sharma et al. [4]	Cloud Computing
Security	In 2017, B. A. Mozzaquatro et al.[8]	IoT
Interoperability	In 2006, B. Elvesæter et al. [9]	Software Systems

### Conclusion

Consistency is the main criteria to check the success of an element. And MDA model is a true example. It has a vast history of success. But even now if somebody wants a solution, MDA is giving a hope. This paper has a covered comprehensive areas like : No SQL, Big Data, IoT, Intelligence, all are prevalent technologies for today. Even for finding solutions on these technologies MDA model is a ray of hope especially for scalability and cross platform interoperability.

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