C H A P T E R - 0 2

LITERATURE REVIEW

Object Oriented Languages and their semantics are well modeled by using Object Constraint Language (OCL). OCL is mainly focusing on the application of constraints in the UML diagrams. These OCL integrated UML is being utilized for the modeling of real time systems. Real time systems properties are well represented by application Computational Tree Logic (CTL). For the formal verification of the developed models, such types of approaches are highly applicable. Real Time Constraint Notation (RTCN) is used for representing and modeling the constraints in real time modeling.

More formal programming methods of OCL have been introduced in [14] also the powerful combination of UML and OCL are discussed. Mode Driven Architecture (MDA) is also utilizing the application of OCL and UML as well.

Being the part of UML, OCL has been utilized in many theories and object oriented system modeling. Such contributions are well discussed in [15].

For implementing security Role Based Access control (RBAC) has been developed in [16]. For object oriented analysis and
design OCL has been used. Using OCL it describes that what should be constraints for the RBAC approval.

OCL has been used as constraint for modeling element in a textual specification scenario [17]. OCL expressions and constraints are translated into Java language. A run time assertion checker is used in JML tool.

OCLLib, OCLUnit and OCLDoc are proposed in [18]. OCL lip makes easier for the development of OCL expressions and constraints. It makes a high reuse factor which is configurable and testable named as OCL unit and OCL DOC. For model comprehensibility and maintenance, OCL has been used in [19]. We have utilized this concept in development of RTCN framework.

For achieving significant advantage, OCL constraints UML have been introduced.

OCL can be identified as similar constraint language called progress, called path expressions. The development of progress and OCL with different extensions has been proposed in [20].

A OCL based unified modeling language has been proposed in [21], for model driven representation of distribution systems, also Role based access control with authorization
constraints. The overall objective is to develop be Secure Distributed System (SDS).

For user role assignment and permission role assignment in a role based access control, a constraint specification language is used in [22], it represents how can one role based access constraints map into object constraint language.

For the specification of security policies, for implementing different access control mechanism a ponder policy specification language has been developed in [23]. This is a declarative, object oriented and strongly typed language.

A security policy using Object Constraint Language has been developed in [24] secure MOVA tool utilized to answer the result of the proposed approval verification of non trivial security properties.

An access control Meta model has been developed [25] using unified modeling language (UML). This modeling language is independent of access control requirement using genetic mutation along with independency from specific implementations.

An experiments framework has been proposed in [26], for evaluation the constraints in object constraints language, along with Automated support for OCL refactoring.
Modeling Business process is one of the important issues in maintaining competitions and dealing with challenges in business environment. In [27] a business process modeling has been carried out issuing UML2.0 activity diagram. For specification of constraints OCL has been utilized. A model based verification has been proposed in [28], using Unified Modeling Language (UML). A formal verification and validation approach has been developed to represent a security-critical- system denoted by Patent Document System (PDS).

Model driven software engineering is the new paradigm for the designing software. For meta-modeling, UML has been used to model the problem along with a static semantic of the language specified by the object constraint language (OCL) as discussed in detail in [29]. The semantic of the whole part relationship has been represented using unified modeling language in [30]. Aggregation and composition aspects are discussed. The constraint axioms are represented using OCL. The actual version is UML 1.4 for this implementation.

In [31] temporal and history based authorization constraints are represented by the OCL. Also, first orders linear temporal logic has been utilized for formally satisfy the constraints.
In [32], OCL has been integrated in three software engineering processes using inspection for model defect, understanding the logic and functioning of the system, change management by analysis. The benefits of using OCL are also discussed. Two controlled experiments are carried out for representing the proposed approach.

A UML based meta-modeling and product line approach has been implemented in [33]. The product lines represents all the software development life cycle. The mapping between multiple views has been discussed.

Business process modeling is well identified and modeled by the model driven declarative approach in [34]. A business process execution language for web services (BPEL4WS) has been proposed which graphically represents the model driven control. The post condition and pre conditions of transformation rules are represented by object constraints modeling language.

OCL is playing an important role in object oriented software development in the framework of UML and Eclipse modeling framework (ENF). In [35] an extension of OCL, Soil (Simple OCL-like Imperative Language) has been proposed, using the a declarative representation.
For modeling information system, the formalizing UML based constraints language OCL has been discussed in [36].

The central characteristics of the BART system are represented by OCL in [37]. The functionality of the system is judged under the USE (UML Specification Environment), it allows one for verification and validation of UML and OCL constraints.

The latest open problem, challenging research issues and tool support are discussed in [38] related to OCL.

A modeling language S-COMMA has been proposed in [39] along with its execution platform. In this, a constraints language has been integrated with the object oriented capabilities.

The checking of object oriented programs has been proposed in [40] with the issues of information flow, integrity and confidentiality. The security types are considered as a policy and represented in a modular way.

A musical composition tool, PECO has been proposed in [41], which is cellular integrity concurrent objects and constraints.

Two integrity constraints for object oriented conceptual modeling has been proposed in [42] in the form of static constraints and creation time constraints.
A constraints PCC has been dealt within [43]. This is a person case constraint which is universal constraint and same as clitic /agreement cluster.

An imperative constraint implementation language, called Limes has been proposed in [44]. This can be used at design level and may add constraint checking for implementation.

A time critical application model has been explained in [45] based on object oriented constraint technology. These are applicable in specific area like, language design, implementations models and other.

The modeling of constraints in object oriented development is formalized in [46]. The objective is to map between extended model and ODMG based model. The expressive power of the model has been extended using object constraint language.

A constraint programming library first CS has been proposed in [47]. This is an effort of integrating constraints in object oriented programming language, JAVA. The approach is proved by code fragments for the implementation.

The extension of UML, UML-F has been proposed in [48]. It allows an extension in terms of frameworks variation points.

A new programming language based on constrained objects is proposed in [49]. This is used for modeling engineering structures declaratively. The proposed approach includes
tools for the authorization of constrained objects class diagram and compiler that converts the class diagram into CLP(R) code.

A constraint solver has been proposed in [50] which are having independent object-oriented inferences.

A stand alone generic model management language has been developed in [51]. This language is named as EOL and is based on OCL. It can model merging, comparison and text production language.

An automated feature model based generation for the model refinement process has been proposed in [52].

For high order transformation, model driven approach are utilized in [53]. The automatic integration of performance completion has been proposed in Palladio Component Model.

A model based user interface has been developed in [54] in which various levels of abstraction are used. Also, intra- and inter- model verification and validation has been applied.

Two modeling language sysML and system C- UML profiles are integrated with each otherwise [55]. This integration is based on the mapping between sysML into system C- UML is represents control how group and sysC processes state machines.
A UML based compliance checking approach has been proposed in [56, 57] for the TLM2 models and this is based on UML sequence diagram.

To express the properties of control applications is logic on automata, the behavioral and design methods are used in [58]. This proposed supports partial orders and real time constraints. This has a declarative semantics called Visual Timed-event Scenarios (VTS).

Finite automata and temporal logic formula are used to model bounded model checking (BMC) system in [59]. The verification is achieved by translation into Boolean logic and SAT-solver application along with the bounded satisfiability checking (BSC).

A model driven software development approach has been discussed in [60] with the concept of reusability of component.

In [61] an integration approach of CSP, object –Z and duration calculus has been proposed as new model checking approach. The main focus of these papers is the system exhibiting the communication, data and real time aspects of the systems.
In [62] two new artifacts have been applied within the modeling process, having constraints applied the business process modeling.

For modeling Real-Timed Systems, Timed Automata (TA) have been used in [63]. A refinement process has been used for patching the required algorithm.

The fingerprint scheme has been proposed in [106] in place of password based authentication schemes. The system is proposed with the help of UML modeling.

An effective fingerprint matching approach has been proposed in [107] for ensuring effective security of the transactions using ATM dealing with modern security threats.

A fingerprint biometric authentication approach has been proposed in [108] for the ATM security enhancement. This includes three steps; positive identification, large scale identification and security.

A biometric based user authentication scheme has been proposed in [109]. The major focus is on the use of fingerprint authentication schemes.

A blind biometric authentication protocol has been developed in [110]. This protocol shows only the identity and no
additional information about the user or the authentication servers.

Also, in [111] the fingerprint based authentication approach has been developed using computational intelligence approaches; i.e. fuzzy logic.

Pushdown Automata (PDA) has been applied to deal with various problems related to communication technologies and other.

In [112], the PDA models have been developed to detect the manipulated remote call streams. Also, the finite state machines are used to model the same problem.

The PDA has been reduced to graph theoretic problems [113] and applied in model checking with improved running time using fast graph algorithms.

An attack detection approach has been proposed by learning PDA in [114]. PDA is responsible to track the program location from where the system call was invoked.

A specific version of PDA called Auxiliary PDA has been studied in [115] for semi-unbounded fan-in-circuits.
PDAs are also applicable in services adaptation and composition issues as discussed in [116]. A BPEL adaptor has also been developed using this approach.