Ontology for Nigerian Case Laws

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ABSTRACT
The Nigerian judicial process is unacceptably slow and expensive. We established that efforts so far taken to expedite the judicial process which include front loading processes and opening up of more courts are more tactical than strategic. Information and Communication Technology (ICT) has the strategic capability to expedite the judicial process when properly introduced and effectively managed. This will involve at least the electronic storage of our case laws in machine processable and human readable format; which is strongly dependent on the availability of an appropriate ontology for the Nigerian judicial system. Unfortunately however, no such ontology exists for the Nigerian judicial system. Consequently, adopting the Noy and Mcguiness' methodology, we built an ontology for Nigerian case laws (ONCL) using the Web Ontology Language (OWL) via protégé 3.5 beta editor. The ONCL was modelled using Directed Acyclic Graph (DAG).

Keywords: Ontology, Nigerian judiciary, Semantic web, Case laws, Legal information storage and retrieval

1. INTRODUCTION
The Nigerian Judiciary is one of the arms of government in Nigeria, constitutionally saddled with the responsibility of administration of justice, interpretation of law, trial of offenders, and adjudication. The Nigerian Judiciary unfortunately has been bedevilled with some challenges culminating in widespread speculation that the Nigerian Judicial System is unacceptably slow and expensive. This problem of slow and expensive Nigerian judicial process became more obvious as population and crime rate increased [1]. The Judicial System made frantic effort to absorb this problem of slow judicial process by opening up more courts and abridging its court processes; but the problem still persists.

It is important to note that increasing population and crime rates will no doubt increase the number of cases in our courts; and as these cases contend for court resource (especially case deciders), court processes are bound to be slowed down. Also, the Nigerian judicial system like other judicial systems is strongly case based – stare decisis [3]. Consequently, as the number of cases increases the task of administering justice also increases.

It is therefore easy to appreciate that increasing the number of courts and abridging court processes (front loading processes) help churn-out case laws and thus further complicate subsequent cases still in process. In as much as we cannot turn our cities to court rooms and the judicial process cannot be abridged below a tolerable limit; the Nigerian judicial system will remain slow and expensive. Possible issues arising from the large churning out of cases include: (i) how and where will these cases be stored? (ii) How will the cases be accessed and retrieved? (iii) Very importantly, how efficient and effective is the access and retrieval scheme? Addressing these issues is no doubt critical to expediting justice delivery in Nigeria. Presently, concluded cases are textually stored on paper (books, court proceedings, law reports of various types e.t.c.).

The problem with this storage mechanism is that it is not green with its resultant environmental implications/consequences. More so, this scheme requires physical storage space which is obviously limited. Besides, its search and retrieval mechanism is manual which makes the scheme herculean. This will not only slow down the judicial process but also adversely affects the health of the advocates and case deciders.
Nonetheless, the limited space and difficulty of case access and retrieval associated with this scheme may lead to ineffective retrieval of case laws. The inconvenience associated with this scheme is another problem. For instance in Nigeria, advocates or counsel had to go to court with big bags of relevant literature which probably took them several weeks if not months to retrieve and will almost take the case considerers the same amount of time and effort to appreciate. This no doubt will seriously affect the efficiency and effectiveness of our judicial process.

Ordinarily, with the potentials of the computer which includes processing speed, persistence, large storage capacity, and communicative capability as well as the benefits associated with Information and Communicative Technology (ICT); everyone would advocate for electronic storage of case laws. Though this can provide unlimited storage space, electronic information is presently syntactically organized, accessed and retrieved. The problem with this scheme is that most of the search results are irrelevant and so much man-hour is still required to get the relevant case laws (documents). It appears therefore, that a well-organized manual storage, access and retrieval system may not be less efficient.

It is therefore obvious that this electronic scheme only addresses the problem of space and not the primary problem of inefficient access and retrieval of relevant case laws. We therefore need a scheme though electronic that will guarantee or ensure high relevance of case laws retrieved. In recent times, this problem of effective and efficient information access and retrieval has generated a lot of interest in computing leading to the advent of a new computing domain called semantic web (web 3.0) – an extension of the current web [6] that charged itself with the responsibility to meaningfully organize information in memory and efficiently access and retrieve required information with high relevance – precision and recall [26].

Basically, semantic retrieval systems consist of three basic elements: search engine, ontology and corpus [30] as depicted in Figure 1.1. Ontology in addition to being the cornerstone of semantic web [36], is obviously what distinguishes one semantic retrieval systems from another, even in the same domain. In other words, a semantic retrieval system for American judicial system can only be used in Nigeria or Ghana, only if the ontology is uniquely redesigned and built for the Nigerian or Ghanaian judicial system.

![Figure 1.1: Schematic View of a Semantic Retrieval System.](image-url)
Some works have been done on building ontology for legal system of some advanced countries with a view to expediting their justice delivery system [8, 10, 11, 30, 37] but none to our knowledge exists for the Nigerian judicial system.

A good way therefore for Nigeria to catch up with these countries in their move towards expediting their justice delivery system is to commence very quickly the development of ontology for the Nigerian judicial system. Nigeria can then put her cases in electronic forms (corpus) and reuse any suitable search engine; for efficient access and retrieval of case laws with high precision and recall. Consequently, this paper geared towards expediting the Nigerian justice delivery system, builds ontology for the Nigerian case laws.

2. BACKGROUND INFORMATION

The accurate and efficient access/retrieval of information from the vast amount of the information (usually unstructured or semi structured) available on an increasingly expanding digital information repository, such as the web, is difficult [30, 34]. Results returned to user from such search queries are usually verbose and this invariably conditions the users to painstakingly go through large number of returned documents to discover the documents that are really relevant [22, 41].

This problem of inaccurate search result stems from lack of proper storage structure of the digital information repository [25, 34]; as is the case with the current web also referred to as web 2.0. Web 2.0 lacks a standard for information storage, searches by keywords and hence, weakens its information retrieval precision and recall particularly with polysemy (words with multiple meanings) and synonymy (different words with same meaning) [22, 26, 34, 37]. This led to the extension of web 2.0 to web 3.0 (or semantic web as it is popularly called). The Semantic web unlike the web 2.0 properly structures information in the repository, understands polysemy and synonymy and hence returns search results with high precision and recall [22, 25, 26].

2.1 Concept of Semantic Web

Semantic web simply extends the current web such that information is given well-defined meaning so that human and machines can work cooperatively [6, 18, 41]. The semantic web is a mesh or network of information linked up in such a way that it can easily be processed by machines on a global scale [9]. The semantic web document is different from that of the current web because it is authored primarily for automatic machine processing, though human readable. Besides, unlike hyperlinks between web documents, links between semantic web documents are decorated [30, 41]. Semantic web is able to extend the current web by a number of approaches which could be one or a combination of two or more of the four basic approaches to semantic web as depicted in figure 2.1.
These four basic approaches to semantic web are highlighted as follows:

i. **Contextual analysis**: this approach helps disambiguate queries by critically analysing the context of the make-up of the queries issued by the users. For example, the word “strike” may refer to baseball or labour or even something else entirely. So, by using contextual analysis, one would be able to tell what the word means at a particular point in time.

ii. **Reasoning**: in this approach, deduction through reasoning is a driving force. Given a set of facts that are represented in the system, additional fact can be inferred from them. For example, if the system knows who Prof. Onibere’s children were and it knows who each of their children were also, then a reasoning system can infer who Prof. Onibere’s grandchildren are.

iii. **Natural Language**: this approach emphasizes on natural language understanding.

iv. **Ontology**: this approach uses concepts, properties and instances of the concepts to represent knowledge about a domain and expand queries. The crux of this approach is in its ability to make search more focused as well as more broad. This has made it found applications in so many domains.

### 2.1.1 Semantic Web Architecture

The semantic web architecture as first proposed by Tim Berners-Lee is as depicted in figure 2.2 [9, 10, 28]. Over the years however, variations to this original semantic web stack have been introduced to make it more domain specific. A particular variation is the legal semantic web architecture [31] shown in figure 2.3.
In general, semantic web architecture is a layered architecture which consists of seven basic layers or components. The following sub paragraphs describe these components starting from the base layer of the architecture to the topmost layer in order.

Layer 1: this layer consists of the Unicode and Uniform Resource Identifier (URI). Unicode is the standard for computer character representation and URI is the standard for identifying and locating resources such as case laws in a digital legal repository. The semantic web is built on syntaxes which use the URIs to represent data usually in triples.

Layer 2: this is the Extensible Mark-up Language (XML) layer. XML and its related standards such as namespaces and schemas form a common means for structuring data on a data repository but without communicating the meaning of the data.

Layer 3: this layer holds the Resource Description Framework (RDF) and its schema. RDF is a simple metadata representation framework that uses the URIs to identify resources on a data repository and graph model for describing relationships between resources. The RDF Schema is a modelling language for describing classes of resources and properties between them in the basic RDF model and provides a simple reasoning framework for inferring types of resources.
Layer 4: the Ontology layer provides a more complex constraint on the type of resources and their properties.

Layer 5: the Logic layer provides the basis (norms and facts) for reasoning and inferences.

Layer 6: the Proof layer is an automatic reasoning component provided on top of the logic layer to make new inferences. With this, a software agent can actually make deduction as to whether a resource satisfies its requirements or not.

Layer 7: this is the layer which addresses the issue of trust that can be supported by the semantic web. The issues addressed at this layer ranges from making sure that the premises from which statements are derived come from a trusted source to relying on formal logic when deriving new information.

2.2 Concept of Ontology

Ontology is a critical component of semantic web being the only way the content of the web can be marked up for automatic information processing [30, 36]. Ontology as a concept has its root in Philosophy, where it is seen as “the science of what is, of the kinds and structures of objects, properties, events, processes and relations in every area of reality” [32]; it is from here the term ontology was borrowed to be used in Computer Science and Artificial Intelligence (AI), in particular. The most prominent definition of the term in AI is that of Gruber [16] who defined ontology as an “explicit specification of a conceptualization”. Other more explicit definitions were given by [23, 29, 33, 38, 39].

2.2.1 Classification of Ontologies

Several ontologies exist in literature [7, 8, 10, 11, 37]. Generally, we can classify ontology based on purpose, formality or complexity [10] but the most pronounced is the classification by purpose or ontological commitment. [40] describes three types of ontological commitments – task commitment, method commitment and domain commitment.

2.3 Building Ontology

There are several reasons for building ontology. Some of which are as follows [4, 29]:

- To share common understanding of the structure of information among people or software agents.
- To enable reuse of domain knowledge.
- To make domain assumptions explicit.
- To separate domain knowledge from the operational knowledge.
- To analyse domain knowledge.

It is important to note that in Software Engineering, lack of standard methodologies was the major issue that led to what was termed software crisis – inability of software to meet user requirements as well as software development project exceeding budget and deadline [12, 13, 14]. To tackle this crisis, Software Engineers had to come up with standard methodologies which today abound in the domain; semantic web inclusive.

Today, several standard methodologies such as the Lenat and Guha methodology [24], The Gruninger and Fox methodology [17], KATUS methodology [5] and the Noy and McGuinness methodology [29] exist for the development and evaluation of ontology. [29] made it clear that there is no specific correct way or methodology for developing ontologies but did discuss general issues to consider and offered a possible process for developing an ontology. The process they described was an iterative one where a rough first pass at the ontology is made and then a revision and refinement of the evolving ontology is carried out.

They identified the following steps:

- **Step I**: Determine the domain and scope of the ontology
- **Step II**: Consider reusing existing ontologies
- **Step III**: Enumerate important terms in the ontology
- **Step IV**: define the classes and the class hierarchy
- **Step V**: Define the properties of the classes
- **Step VI**: Define the value of the slots
- **Step VII**: Create instances

This paper adopts the Noy and McGuinness methodology for the development of Nigerian Case Laws due to its simplicity and robustness.

2.3.1 Tools for Building Ontology

Apart from the methodology (i.e. process), we also need tools to build ontology. Notable among them are the Resource Description Framework (RDF) and Web Ontology Language (OWL) [10].
Resource Description Framework (RDF)

The primary aim of the semantic web as earlier stated, is to make information on the web machine-processable in addition to it being human readable and understandable. This is made possible with RDF. RDF is based on the idea that things being described have properties with values, and that, resources can be described by making statements that specify those properties and values. The RDF uses a particular terminology to describe the various parts of the statements.

The part that identifies the thing the statement is about (e.g. case laws) is called the subject, the part that identifies the properties or characteristics of the subject that the statements specify (e.g. creator, creation-date) is the predicate and the part that identifies the value of that property is called the object. In a nutshell, the RDF represents information in triples (subject predicate object). For instance, given the English statement: http://www.example.org/index.html has a creator whose value is John Smith. The RDF terms for various parts of the statement (triple representation of the statement) are: the subject is the Uniform Resource Locator (URL) http://www.example.org/index.html, the predicate is the creator and the object is the phrase, John Smith.

To make these statements suitable for machine processing, two things are actually needed: (i) a system of machine-processable identifiers for identifying a subject, predicate, or object in a statement without possibility of confusion with a similar looking identifier that might be used by someone else on the data repository (ii) a machine-processable language for representing these statements and exchanging them between machines [27]. The web already provides one form of identifier, the URL— a character string that identifies a web resource by representing its primary access mechanism (essentially its network “location”). However, it is also important to be able to record information about many things that do not have network locations or URLs unlike web pages; this can only be made possible by a more general form of identifier in the name, Uniform Resource Identifier (URI). RDF therefore uses URI references because of its generality. Furthermore, to represent RDF statements in machine-processable form, RDF uses the XML. XML was designed to allow anyone to design their own document format and then write a document in that format. RDF defines a specific XML referred to as the RDF/XML for representing RDF information and for exchanging it between machines.

The RDF uses graph models to describe the relationship between resources. It uses a node for the subject, an arc for the predicate, and a node for the object. An example is depicted in figure 2.4. In figure 2.4, the ellipses marked Case Decider, Judge, Magistrate, Accessor, Ekuobase, Ebietomere and Onibere are the nodes. The arrows marked “includes” and “is-A” are the arcs which show the links between the nodes where they exist. If we take for instance the nodes, Judge and Ekuobase linked with the arc is-A (which connotes that Ekuobase is a Judge) the node Ekuobase is the subject, is-A relation is the predicate and the node Judge is the object.

![Figure 2.4: RDF Graph Model for Case decider.](image-url)
The Nigerian legal system is characterized by the following [1]:
- It is based on the common law tradition
- Reception of English law
- Complexity- Nigeria operates a federal system of government, a system of government which emphasizes local autonomy for the various level of government. Different states therefore have their own law which sometimes differ from the federal laws and as well other states. This results in single complex legal system.
- Recognition of customary law
- Slow judicial process

Just like most legal systems in the world, the Nigeria legal system has its root in the following:

**English Law**

The Received English Law as a source of Nigerian law is made up of three arms [3]:
- Common Law: Nigeria has common ancestry with other countries like Canada, United States of America, Ghana, and Australia amongst others. This is due to fact that they were colonized by the Great Britain who founded the Common law. The common law comprises the judgements and decrees of courts recognizing, affirming and enforcing such usages and customs of ancient unwritten laws of England [3].
- Doctrine of Equity: this is based on principle of fairness, justice and good conscience as opposed to strict law. They are actually laws formulated by the Lord Chancellor in the court of Chancery in England. This doctrine came to being in order to mitigate the harshness and rigidity of the common law.
- Statute of general application: Laws made by the British parliament prior to 1st January 1900 were adopted by virtue of Section 45 of the interpretation Act 1958.

**Customary Law**

The diversity of Nigeria as a society had given rise to various customary laws – laws and customs accepted as binding amongst members of a particular community. They are unwritten laws and indigenous to the local communities. It is important to note that customary law is not applicable in Nigeria, if it is either contrary to public policy, repugnant to natural justice, equity and good conscience or if it is inconsistent with any law currently in force in Nigeria.

**Nigerian Legislation**

This is made up of statutes and subsidiary legislation.
- Statute: they are laws enacted by the legislative arm of government in Nigeria. At the federal level, it is comprised of the senate and the house of representative which makes up the national assembly, and at the state level it is the houses of assembly of the various states.
- Subsidiary Legislation: these are laws that are enacted under the powers conferred by statute. Examples are orders, rules and regulations, bye-laws made by ministers, commissioners or local government chairmen.

**Case laws or Judicial Precedent**

These are laws that are contained in the decisions of the courts. Judicial precedent is the reason for the decision a court has taken. When these principles are laid down by a superior court, all other lower courts must follow the rules when deciding other cases that has the same fact as those cases where the principles where laid down. There are two types of judicial precedent, the binding precedent and the persuasive precedent. The binding is where it mandatory for the lower court to follow the laid down principles while the persuasive is where it is not mandatory for the lower court to follow the laid down principle.
2.5.1 The Nigerian Judiciary

The Judiciary is an arm of government concerned with the ascertainment of facts and the laws relating thereto and the application of the relevant law to the facts for the purpose of determining claims, controversies and disputes [1]. The Judiciary in the Nigerian legal system is responsible for determining disputes between individuals or between the government or any of its agencies and the citizens [21]. It has been described as the last hope for the common man simply because if all else fails, the judiciary can always be relied on to do justice between the contending parties. In the absence of a means of adjudication which the judiciary represents, the law of the jungle prevails. The adjudication function of the judiciary is performed by judges whose qualification and appointments are subject of constitutional provisions.

The constitutional provisions on the appointment of judges are designed to ensure that only men of probity and high integrity are appointed into the position of a judge. There are also provisions for the tenure, pension rights and removal of judicial officers in Nigeria.

2.5.2 Types and Jurisdiction of Courts in Nigeria

Judicial powers of the federation and the states are vested on the following courts by the section 6(1) and (2) of the 1999 constitution.

a) The Supreme Court of Nigeria
b) The Court of Appeal
c) The Federal High Court
d) The High Court of the Federal Capital Territory, Abuja
e) The State High Court
f) The Sharia Court of Appeal of the Federal Capital Territory, Abuja
g) A Sharia Court of Appeal of States
h) The Customary Court of Appeal of the Federal Capital Territory
i) A Customary court of Appeal of the State
j) Such other courts as may be authorised by law to exercise jurisdiction on matters with respect to which the National Assembly may make laws, and
k) Such other courts as may be authorised by law to exercise jurisdiction at first instance or on appeal on the matters with respect to which a House of Assembly of a state may make laws.

The courts in Nigeria are divided into inferior and superior courts of record. A court of record as the name implies is a court which keeps records of its proceedings. All the courts in Nigeria are courts of record. Superior courts of record are courts which have power to punish for contempt committed both in the face of the court and also outside the court. Inferior courts of record on the other hand are courts which can only punish for contempt committed in the face of the court. The High courts and other higher courts are superior courts of record.

- **The Supreme Court of Nigeria:** The Supreme Court was established by section 230(1) of the 1999 constitution. The Supreme Court of Nigeria consists of: a) the chief Justice of Nigeria and, b) such number of justices of the Supreme Court not exceeding twenty-one, as may be prescribed by an Act of the National Assembly. Besides, the Supreme Court has two types of jurisdiction as specified by section 232 (1) and (2), and section 233 (1) of 1999 constitution; the original jurisdiction and the appellate jurisdiction. The Supreme Court has original jurisdiction in any dispute between the Federation and a State or between States if and in so far as that disputes involves any question (whether of law or fact) on which the existence or extent of a legal right depends. In addition, the Supreme Court shall have such original jurisdiction as may be conferred upon it by any Act of the National Assembly, provided that no original jurisdiction shall be conferred upon the Supreme Court with respect to any criminal matter. The Supreme Court has exclusive appellate jurisdiction over appeals from the court of Appeal. The Supreme Court is the final court in Nigeria and no judicial appeal shall lie to any other body or person from any decision of the Supreme Court.

- **The Court of Appeal:** the Court of Appeal is deemed established by section 237 (1) of the 1999 constitution. The court consists of not less than forty-nine justices, out of which not less than three each must be learned in Islamic personal law and customary law; as prescribed by an Act of the National Assembly. Section 239 (1) and (2) and section 240 of the 1999 constitution made it clear that the court of Appeal has original and appellate jurisdiction respectively. It has the original jurisdiction to hear and determine any question as to whether; a) any person has been validly elected to the office of president or vice president, b) the term of the office of the president or the vice president has ceased, c) the office of the
president or vice president has become vacant. The Court of Appeal has the appellate jurisdiction to hear and determine appeals from the federal High Court, the High Court of the Federal capital Territory, Abuja and of the States, the Sharia Court of Appeal, both of the Federal Capital Territory, Abuja and the States. The court also has appellate jurisdiction over the decisions of a court Martial or other Tribunals may be prescribed by an Act of the National Assembly.

- **The Federal High Court:** this court was first established as the Federal Revenue Court by the Federal Revenue Court Act of 1973. It was restyled as the Federal High Court by section 230 (2) of the 1979 constitution. The Federal High court is now deemed established by section 249 (1) of the 1999 constitution. The court has exclusive jurisdiction over law suits concerning the following matters; a) federal revenue, b) federal and company taxation, c) customs and excise, d) banking, banks and other financial institutions, e) matters arising from the Companies and Allied Matters Act, f) federal enactments on copyright, patent, designs and trademarks, g) admiralty matters, h) diplomatic and consular relations, i) citizenship, j) bankruptcy and insolvency, k) aviation and safety of aircraft, l) arms, ammunition and explosives, m) drugs and poisons, n) mines and minerals, o) weights and measures, p) the administration or the management and control of the Federal Government or any of its agencies, q) operation and interpretation of the constitution in so far as it affects the Federal Government or any of its agencies, r) any action challenging the validity of any executive or administrative action or decision by the Federal Government or any of its agencies, s) such other jurisdiction as may be confered upon it by an Act of the National Assembly. Besides, the Federal High Court has jurisdiction in respect of criminal causes and matters concerning the matters in which jurisdiction is conferred on it. The court also has jurisdiction in respect of treason and treasonable felony and allied offences.

- **State High Courts:** the High Court of a State is established by section 270 (1) of the 1999 constitution. It consists of, a) a Chief Judge of the State; and b) such number of Judges of the High court as may be prescribed by a Law of the House of Assembly of the State. Section 272 (1) and (2) provided for the High court of the State to have the jurisdiction to hear and determine any civil proceedings in which the existence or extent of legal right, power, duty, liability, privilege, interest, obligation or claim is in issue or to hear and determine any criminal proceedings involving or relating to any penalty, forfeiture, punishment or other liability in respect of an offence committed by any person. It also, has original and appellate jurisdiction. Its appellate jurisdiction is exercised over the Magistrate courts, area customary and Alkali Courts on questions of law arising from decisions of those courts.

- **The Sharia Court of Appeal and Customary Court of Appeal:** the State and Federal Capital Territory, Abuja are empowered, if they so require, to establish Sharia Court of Appeal and the Customary Court of Appeal. The Sharia court of Appeal has appellate and supervisory jurisdiction in civil proceedings involving questions of Islamic personal law. The court has such other jurisdiction as may be conferred upon it by law.

- **The Magistrate Courts:** the Magistrate Courts exist all over the country. They are established and regulated by different Magistrate court laws of various jurisdictions. The Chief Judge of a State is empowered to divide the state into magisterial districts, constitute in any part of the state a magisterial district or, distinguish such names or number as he may think proper, and vary the limits of any such districts. The civil and criminal jurisdictions of the various grades of Magistrates are set out in the Magistrate Courts law.

- **The Customary Courts:** the Customary Courts were established by the customary courts laws of the various states of the Federation. In Edo State and Delta State, the governing law is the customary courts law of 1984 of the defunct Bendel State. The law established two grades of Customary Courts, the District and the Area Customary Courts. Every Customary Court, be it District or Area is a court of record.
3. BUILDING ONTOLOGY FOR NIGERIA CASE LAWS

The high level design of the Ontology for the Nigeria Case Laws (ONCL) is captured in figure 3.1.

Figure 3.1: The High Level View of the ONCL.

Figure 3.1 depicts the ONCL high level concepts and their relationships. The concepts are Actor, Court and Case and the relations are has, actIn, hasJurisdictionOver, isJurisdictionOf, precideOver, and isPrecidedOverBy. The details of these concepts are further exposed and depicted in figure 3.2a, figure 3.2b and figure 3.2c using Directed Acyclic Graph (DAG).

Figure 3.2a: The DAG for Actor concept
Figure 3.2a is a DAG showing the Actor concept. On level 1 of the figure is Person and CaseDecider concepts which are sub-concepts to the Actor concepts. Level 2 holds the NPerson (Natural Person), JPerson (Juristic Person) which are sub-concepts of the class Person, and the Judge, Magistrate, Kadi, Accessor which are sub-concepts of the class CaseDeciders. Similarly, level 3 holds two sub-concepts of the JPerson namely; Company and Association.

Similarly, Figure 3.2b has two levels. Level 1 holds sub-concepts Supreme, Appeal, High, Sharia, Cust (Customary), SO (Such Other) all being types of courts. Level 2 consists of SAFCT (Sharia Court of Appeal of Federal Capital Territory), SAS (Sharia Court of Appeal of States), Fed (Federal High Court), FCT (Federal Capital Territory High Court), State (States High Court), CAFC (Customary Court of Appeal of Federal Capital Territory) and CAS (Customary Court of Appeal of States).
Figure 3.2c: The DAG for Case

Figure 3.2c shows the Case concept with three levels. Level 1 consists of Simple, MDMN (Misdemeanor), and Felony sub-concepts. On level 2 are Pejury, Burglary, A&B (Assault and Battery), Killing, and SexualOff (Sexual Offences). The class labelled nCases and the ellipses symbol shown at level 2 is an indication that we can have as many cases as possible within that level to a known number of cases as defined by n. Besides, Murder, ManS (Manslaughter), DYP (Defilement of Young Person), Rape, IAssault (Indescent Assault) are on level 3. In the development of the ONCL, we employed Protégé—an ontology development environment. The concepts and the properties used in the ONCL are shown in figure 3.4 and figure 3.5 respectively.
Figure 3.4a: ONCL concept

Figure 3.4b: ONCL concepts continuation
The RDF/XML code for the ONCL will be made available on request. It is important to note that the evaluation of ontology is one key aspect of ontology building because it could serve as benchmark for the developers to keep focus of the purpose for which the ontologies are built and more importantly, it could help ameliorate the risk involved in choosing an appropriate ontology by the end users for their applications particularly with the proliferation of ontologies.

We therefore exposed the potential of the ONCL in line with its purpose. This we reported separately in another paper.
4. CONCLUSION

We exposed that the Nigerian Judicial System is bedevilled with the problem of slow and expensive delivery of justice. We also established that the purported solution of front loading processes and opening of new courts is not only transient but also will make the justice delivery process even slower. Though ICT appears to be a panacea to this problem of slow Nigerian justice delivery system, we made clear that a necessary ICT component that can make this possible is not in existence. This component – ontology for Nigerian case laws (ONCL) – will support the machine processing and human readability of case laws as well as guarantee the effective and efficient storage, access and retrieval of these case laws.

Consequently, ONCL was built. In doing this, we adopted the Noy and Mcguinness’ methodology. ONCL was modelled using DAG and was built using protégé 3.5 beta OWL (Web Ontology Language) editor. It is hoped therefore that with ONCL now in place, the slow and expensive Nigerian justice delivery system will become a thing of the past; particularly when the following recommendations are faithfully implemented.

4.1 Recommendation

To expedite the Nigerian justice delivery system, it is imperative to:

i. Expand ONCL to incorporate the case laws for the entire Nigerian Legal System.
ii. Build and deploy a complete ONCL system for real life use in the Nigerian judicial system.

REFERENCES


