ORIGINAL RESEARCH PAPER

NLization with EUGENE: A UNL Approach

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"Universal Networking Language is a computer language created to represent and process information across language barriers (Uchida, et al., 2001)." The process of text conversion and text deconversion is carried out by two components of the UNL system i.e. IAN (Interactive Analyzer) and EUGENE (Deep to Surface Structure Generator). The purpose of the present work is to implement the EUGENE tool for NLizing the UCA-1 corpus (corpus available at www.unlweb.net). This work is a first serious attempt to incorporate Kashmiri language in the UNL, thus paving a way for the development of a Machine Translation System for Kashmiri language.

Keywords: UNL, NLizing, Kashmiri Language.

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1.0 Introduction

The task of conversion of a text from one language to another performed by a machine is known as Machine Translation. Machine Translation is a broader area involving amalgamation of works from other fields such as Artificial Intelligence, Mathematics, and Statistics etc.

1.1 Approaches to Machine Translation

Machine Translation approaches are categorized into the following categories:

- Direct MT
- Rule-based MT
- Corpus-based MT
- Knowledge-based MT

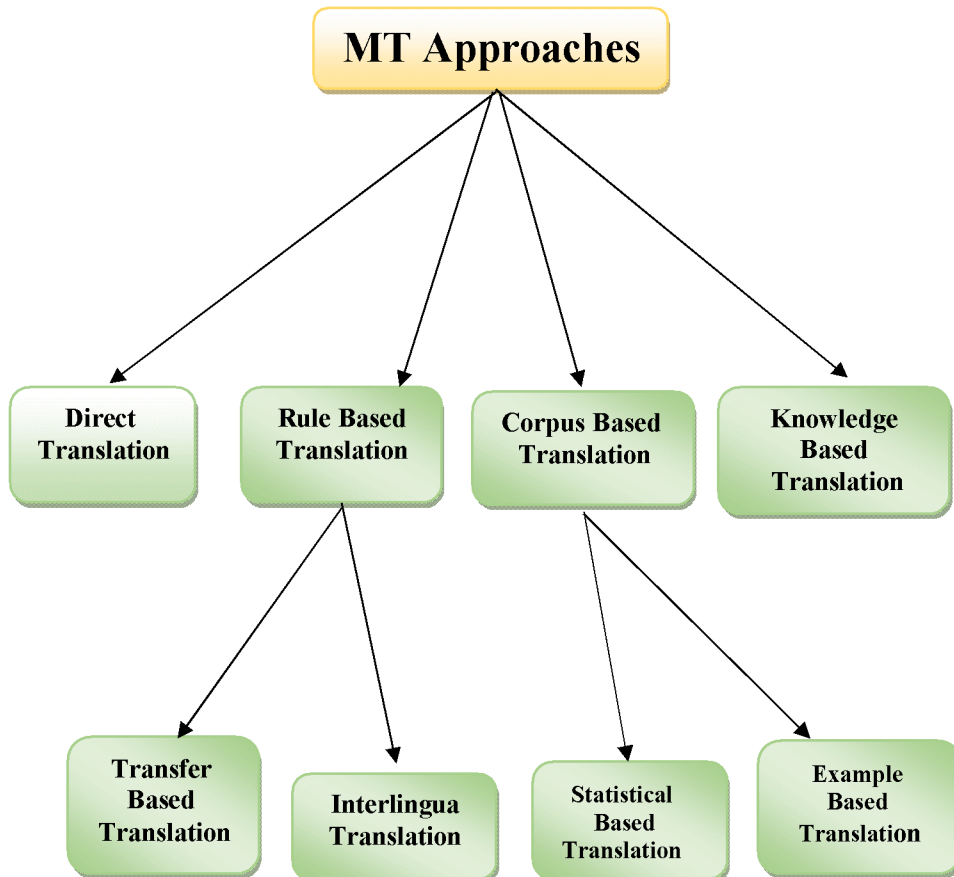Diagrammatic representation of approaches to MT is shown below:

Fig. 1: Approaches to Machine Translation

1.2 Interlingua based MT

In this MT system, the source language text is transformed into an Interlingua (a language- independent representation). The target language text is then generated out of the Interlingua. Thus, the translation involves two stages:

Source Language ⟶ Interlingual representation

Interlingua ⟶ Target Language

As stated by Jurafsky and Martin (2000) "An interlingua represents all sentences that mean the same thing in the same way regardless of the source language they happen to be in." Interlingual approach for MT is most convenient for multilingual machine translation systems. UNL-based MT system is an Interlingua-based MT, and has been explained in detail in section 1.2.1

1.2.1 Universal Networking Language

"Universal Networking Language is a computer language created to represent and process information across language barriers (Uchida, et al., 2001)." UNL is basically a knowledge representation language i.e. it is used to represent information conveyed by natural languages (Cardeñosa, et al., 2009). Unlike natural languages, UNL expressions are completely unambiguous, which reflects the main advantage of this system over other MT systems.

1.2.1.1 Description of UNL System

1.2.1.1.1 Language Resources

Language Resources involve the following components:

- **UNLKB (Knowledge Base)** – Linguistic Knowledge on concepts that are common to every language.
- **Universal word dictionary**, **Analysis** and **Generation** rules.

1.2.1.1.2 Language Servers

Language Servers involve the following tools:

- **EnConverter** - This tool enconverts natural language text into the UNL expression.
- **DeConverter** - This tool deconverts the UNL expression into native languages.

1.2.1.1.3 Software Tools

Software Tools involve the following components:

- **UNL Editors** – UNL Editors are used to make UNL documents.
- **UNL Explorers** – UNL Explorers are used to view/manage UNL document by accessing UNL language servers, UNLKB & UNL Documents.
- **UNL Verifiers** – It verifies UNL expression for correctness.
- **UNL Proxy servers** – It Provides communication with language servers.

- **Concept Definitions** – It defines concepts in connection with other concepts.

UNL Documents – These are the documents in which UNL expression is described for each sentence of natural language. (Source http://www.unlweb.net)

2.0 Methodology

The nature of the current research work is analytical. The corpus was selected randomly from Kashmiri books and dictionaries. In addition to this, UC-A1 corpus (manually translated to Kashmiri) was also taken. The corpus for the proposed Kashmiri UNL system was written in the modified Perso- Arabic script which is used officially. The research work involved the UNLisation and NLisation of the selected text with IAN and EUGENE.

The step-wise procedure adopted for the present research is discussed below:

1) Categorization of Kashmiri words into two groups i.e. Temporary words (email id, URL etc.) and Permanent words (Nouns, Adjectives, postpositions etc).
2) Assignment of grammatical categories to all the lexical categories present in the selected corpus.
3) Dictionary making and paradigm construction in IAN and EUGENE.
4) Framing analysis and generation rules.

3.0 Labels used in the UNL System

Labels used for representing the morphological, syntactic and semantic attributes of words in the UNL system are given in the table:

Label used	Description
N	Lexical category of Noun
LEX	Lexical category
POS	Part of speech
NUM	Number
SNG	Singular
PLR	Plural
INV	Invariant
SNGT	Singulare tantum
GEN	Gender
MAS	Masculine
FEM	Feminine
J	Lexical category of Adjective
ADJ	Adjective
QUA	Quantifier

Label used	Description
D	Lexical category of Determiner
POD	Possessive Determiner
ART	Article
CAS	Case
DAT	Dative case
A	Adverb
P	Lexical category of postposition
PSPT	Part of speech of Postposition
NTST	Intransitive Verb
V	Lexical category of Verb
VER	Part of speech of Verb
R	Pronoun
C	Lexical category of Conjunction
CCJ	Coordinating Conjunction
U	Lexical category of cardinal
CDN	Cardinal
PPN	Proper noun
PER	Person
PAR	Paradigm
Kas	Kashmiri
ABL	Ablative case
NOM	Nominative case
ERG	Ergative case
TEMP	Temporary word
FPR	Reflexive pronoun
3PS	3rd person
2PS	2nd person
PPR	Personal pronoun

4.0 Analysis/Working of EUGENE Tool

The process of transformation of UNL expressions to the target language is known as NLisation or Generation. In order to perform the language generation task, EUGENE (dEep-to-sUrface natural language GENErator), created by the UNDL Foundation is used. EUGENE tool has 7 tabs: Welcome tab, NL Input tab, Dictionaries tab, T-Rules tab, D-Rules tab, EUGENE tab, and Compare tab. The decoding process is done by the EUGENE tool using the UNL- NL Dictionary and transformational rules.

The analysis of the different parts of speech for Kashmiri is explained below under different headings:

4.1 NLisation of Noun Phrases

NLisation of Nouns with different determiners is explained in the below given table:

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	ٹرکِم /ṭraki/	*trucks*	Rule 1: (%x,M2):=(%x,-M2,+FLX(PLR:=0> "ؠ";SNG:=0> "")); Rule 2: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[ٹـ————رک]{}"truck" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>;	truck.@pl
2.	بٟار /bʲaːri/	*Cats*	Rule 1: (%x,M2):=(%x,-M2,+FLX(PLR:=0> "ؠ";SNG:=0> "")); Rule 2: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[بٟ————أر]{}"cat" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>;	cat.@pl
3.	اۆنگجِم /oŋdʒi/	*fingers*	Rule 1: (%x,M2):=(%x,-M2,+FLX(PLR:=0> "ؠ";SNG:=0> "")); Rule 2: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[اۆنگ————ج]{}"finger" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>;	finger.@pl
4.	نَر /nari/	*arms*	Rule 1: (%x,M2):=(%x,-M2,+FLX(PLR:=0> "ؠ";SNG:=0> "")); Rule 2: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[أ————ر]{}"arm" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>;	arm.@pl

4.1.1 Generation of Noun with plural marker
Generation of Adjectives

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	پوپ ژوْنٹ /pop tsu:~ʈ/	*ripe apple*	mod(N,%a;J, %b):=(%b)(" ")(%a);	[پیـڑ]{}"ripe"(LEX=J,POS =ADJ)<kas,0,0>; [ژوْنـٹ]{}"apple" (LEX=N,POS=NOU,NUM =SNG)<kas,0,0>;	mod(apple,ripe)
2.	اوْبرِ آسمان /obrɨ a:sma:n/	*cloudy sky*	mod(N,%a;J, %b):=(%b)(" ")(%a);	[اوْبـرِ]{}"cloudy"(LEX=J,P OS=ADJ)<kas,0,0>; [آسـمان]{}"sky" (LEX=N,POS=NOU,NUM =INV)<kas,0,0>; white sky	mod(sky,cloudy)
3.	لوکٹ انسان /lɔkuʈ insa:n/	*young man*	mod(N,%a;J, %b):=(%b)(" ")(%a);	[لوکٹ]{}"young"(LEX=J,P OS=ADJ)<kas,0,0>; [انسـان]{}"man" (LEX=N,POS=NOU,NUM =INV)<kas,0,0>;	mod(man,young)

4.2 NLisation of Quantifying Adjectives (multal)

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	واریاہ درواز /va:rjah darva:zɨ/	*many doors*	Rule No. 1: (%a,M2):=(%a,- M2,+FLX(SNG:=0>""; PLR:=0>"ہ";)); Rule No. 2: (N,SNG,@multal,%x): =("واریـاہ")(" ")(%x,- @multal,- NUM,+NUM=PLR); Rule No. 3: (NUM,PLR,FLX,^infle cted,%a):=(!FLX,- FLX,+inflected,%a);	[درواز]{}"door" (LEX=N,POS= NOU,NUM=SN G,PAR=M2)<ka s,0,0>; the books, many books	door.@multal

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
2.	واریاه نال میژنہ /vaːrjah sɨtsnɨ/	*many safetypins*	Rule No. 1: (%a,M2):=(%a,-M2,+FLX(SNG:=0>""; PLR:=0>"ہ";)); Rule No. 2: (N,SNG,@multal,%x): =("واریـاہ")(" ")(%x,-@multal,-NUM,+NUM=PLR); Rule No. 3: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[نـــــــــال]{}"safetypin" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>; the books, many books	safetypin.@multal
3.	سارے نسہ /saːreː nasɨ/	*all noses*	Rule No. 1: (%a,M2):=(%a,-M2,+FLX(SNG:=0>""; PLR:=0>"ہ";)); Rule No. 2: (N,SNG,@all,%a):=(" سارے")(" ")(%a,-@pl,-NUM,+NUM=PLR); Rule No. 3: (NUM,PLR,FLX,^inflected,%a):=(!FLX,-FLX,+inflected,%a);	[نـــــس]{}"nose" (LEX=N,POS=NOU,NUM=SNG,PAR=M2)<kas,0,0>; the books, many books	nose.@all

4.3 NLisation of Indef Article

The generation of indef article plus Noun from the corresponding UNL expression is explained in the below given table:

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	اکھ بس /akʰ bas/	*a bus*	(%a,N,@indef):=("اکھ")("")(%a,-@indef); (%a,N,@indef):=("اکھ")("")(%a,-@indef);	[بـــس]{}"bus"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>;	bus.@indef

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
2.	اكه ټرک /akʰ ṭrak/	*a truck*	(%a,N,@indef):=("اكه"(" ")(%a,-@indef);	[ټــرک]{}"truck"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>;	truck.@indef
3.	اكه بيأر /akʰ bⁱəːr/	*a cat*	(%a,N,@indef):=("اكه"(" ")(%a,-@indef);	[بيأر]{}"cat"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>;	cat.@indef

4.4 NLisation of Noun plus Postposition "پيټه" plus Noun (SNG form)

The generation of Noun plus Postposition plus Noun (singular) from the corresponding UNL expression is explained in the table below:

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	ټيبلس پيټه كِتاب /teːblas pⁱeṭ kitaːb/	*the book on the table*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س ")); Rule 2: plc(%c;%a,@on):=(%a)("پيټه")(" ")(" س ")(" ")(%c);	[ټيبـل]{}"table"(LEX=N,POS=NOU,NUM=SNG,PAR=M3)<kas,0,0>; [كتـــاب]{}"book"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>; a book, the book	plc(book,table.@on)
2.	پشس پيټه بيأر /paʃas pⁱeṭ bⁱəːr/	*the cat on the roof*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س ")); Rule 2: plc(%c;%a,@on):=(%a)("پيټه")(" ")(" س ")(" ")(%c);	[يــش]{}"roof"(LEX=N,POS=NOU,NUM=SNG, PAR=M3)<kas,0,0>; the book on the table [بيأر]{}"cat"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>; a book, the book	plc(cat,roof.@on)

4.5 Generation of Noun plus Postposition "پَتهی کِنی" plus Determiner plus Noun

The generation of Noun plus Postposition plus Noun from the corresponding UNL expression is explained in the table below:

S.No.	Result	Rules	Dictionary	English	Kashmiri Corpus
1.	plc(computer.@multal,table.@behind)	Rule 1:(%a,M3):=(%a,-M3,+FLX(DAT=0>"س")); Rule 2:plc(%d,N,SNG,@multal;%a,N,SNG,@on):=(%a)(" ")(" ")("س")(" ")(" پَتهی کِنی)(" وارِیاه")(" ")(%d);	[تٔیبُل]{}"table"(LEX=N,POS=NOU,NUM=SNG,PAR=M3)<kas,0,0>; the book on the table [کمپیوٹر]{}"computer"(LEX=N,POS=NOU,NUM=INV)<kas,0,0>; a book,	*many computers behind the table*	تٔیبلس پَتهی کِنی وارِیاه کمپیوٹر /ṭe:blas pətʰkinʲ va:rija:h kampʲu:ṭar/
2.	plc(pen.@indef,door.@behind)	Rule 1:(%a,M3):=(%a,-M3,+FLX(DAT=0>"س")); Rule 2:plc(%d,N,INV,@indef;%a,N,SNG,@on):=(%a)("س")(" پَتهی")(" ")(" ")("کِنی")(" ")(" اکھ)(" ")(%d);	[دروازِ]{}"door"(LEX=N,POS=NOU,NUM=SNG,PAR=M3)<kas,0,0>; the book on the table [قلٕم]{}"pen"(LEX=N,POS=NOU,NUM=INV)<kas,0,0>; a book, the book	*a pen behind the door*	دروازس پَتهی کِنی اکھ قلم /darva:zas pətʰkinʲ ak kalam/
3.	plc(garden.@paucal,house.@behind)	Rule 1:(%a,M3):=(%a,-M3,+FLX(DAT=0>"س")); Rule 2:plc(%d,N,INV,@paucal;%a,N,SNG,@on):=(%a)(" ")(" ")("س	[مکان]{}"house"(LEX=N,POS=NOU,NUM=SNG,PAR=M3)<kas,0,0>; the book on the table [باغ]{}"garden"(LEX=N,POS=NOU,NUM=INV)	*few gardens behind the house*	مکانس پَتهی کِنی کٔیٹھٕہ باغ /maka:nas pətʰkinʲ keˉh ba:g/

S.No.	Result	Rules	Dictionary	English	Kashmiri Corpus
		")(" ")(" پٹھی کِنی کینہِ ")(" ")(%d);	<kas,0,0>;		
4.	ٹیبلس تَل کنِہِ کِتاب /ṭe:blas talkani kita:b/	Rule 1: (%a,M3):=(%a,- M3,+FLX(DAT: =0>"س")); Rule 2: plc(%c;%a,@un der):=(%a)(" س ")(" ")(" تَل کنِہِ ")(" ")(%c);	[ٹیبِل]{}"table"(LEX =N,POS=NOU,NU M=SNG,PAR=M3) <kas,0,0>; the book on the table [کِتاب]{}"book" (LEX=N,POS=NO U,NUM=SNG)<kas ,0,0>;	plc(book, table.@u nder)
5.	ٹیبِلس سـاپڑس کِتاب اکھ /ṭe:blas sa:jḍas akʰ kita:b/	Rule 1: (%a,M3):=(%a,- M3,+FLX(DAT: =0>"س")); Rule 2:plc(%d,N,INV ,@indef;%a,N,S NG,@beside):=(%a)(" ")(" ")(" س ")(" ")(" سـاپڑس اکھ ")(" ")(%d);	[ٹیبِل]{}"table"(LEX =N,POS=NOU,NU M=SNG,PAR=M3) <kas,0,0>; the book on the table [کِتاب]{}"book"(LE X=N,POS=NOU,N UM=SNG)<kas,0,0 >; a book, the book	plc(book. @indef,ta ble.@bes ide)
6.	ٹیبِلس دؤر کِتاب /ṭe:blas du:r kita:b/	Rule 1: (%a,M3):=(%a,- M3,+FLX(DAT: =0>"س")); Rule 2: plc(%c;%a,@far from):=(%a)(" س دؤر")(" ")(" ")(" ")(%c);	[ٹیبِل]{}"table"(LEX =N,POS=NOU,NU M=SNG,PAR=M3) <kas,0,0>; the book on the table [کِتاب]{}" book" (LEX=N,POS=NO U,NUM=SNG)<kas ,0,0>; a book, the book	plc(book, table.@fa r from)

4.6 Content Relation (NLisation)

The generation of Noun plus Postposition plus Noun is explained with the help of some examples in the below given table:

S.No.	Result	English	Rules	Dictionary (UNL-NL)	UNL input
1.	جانس مُتعلِّق کِتاب /dʒaːnas mutlik/ kitaːb/	*the book about john*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س")); Rule 2: cnt(%c,N;%a,N,PPN,@about):=(%a)(" ")("س ")(" ")("مُتعلِّق")(" ")(%c);	[جـان]{}"john"(LEX=N, POS=PPN,GEN=MCL, PAR=M3)<kas,255,0>; [کِتاب]{}"book"(LEX=N ,POS=NOU,NUM=SN G,)<kas,0,0>;	cnt(book,John. @about)
2.	پیرســــس مُتعلِّق میگزین /peːrsas mutlik megziːn/	*the magazine about paris*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س")); Rule 2: cnt(%c,N;%a,N,PPN,@about):=(%a)(" ")("س ")(" ")("مُتعلِّق")(" ")(%c);	[پیـرس]{}"Paris"(LEX= N,POS=PPN,PAR=M3)<kas,255,0>; [میگزین]{}"magazine"(L EX=N,POS=NOU,NU M=SNG,)<kas,0,0>;	cnt(magazine, Paris.@about)

4.7 Beneficiary Relation (NLisation)

The generation of Noun plus Postpoosition plus Noun from the corresponding UNL expression is explained in the below given table:

S.No.	Result	English	Rules	Dictionary	UNL input
1.	جانس خاطِر کِتاب /dʒaːnas kəːtri kitaːb/	*the book for John*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س")); Rule 2: cnt(%c,N;%a,N,PPN,@for):=(%a)(" ")("س")(" ")("خاطِر")(%c);	[جـانس]{}"john"(LE X=N,POS=PPN,CA S=DAT)<kas,255,0 >; [کتـــاب]{}"book" (LEX=N,POS=NO U,NUM=SNG)<kas ,0,0>;	ben(book,John .@for)

S.No.	Result	English	Rules	Dictionary	UNL input
2.	فـــــاطِمس خـــــأطِر وردى /fa:timas kə:trɨ be:ʈ/	*the uniform for Fatima*	Rule 1: (%a,M3):=(%a,-M3,+FLX(DAT:=0>"س")); Rule 2: cnt(%c,N;%a,N,PPN,@for):=(%a)(" ")("س")("""(" ")("خَأطِر")("""(" ")(%c);	[فـاطِمس]{}"Fatima"(LEX=N,POS=PPN,CAS=DAT)<kas,255,0>; [وردى]{}"uniform"(LEX=N,POS=NOU,NUM=SNG)<kas,0,0>;	ben(uniform,Fatima.@for)

4.8 NLisation of Time Relation

The generation of Noun plus Postposition plus Determiner plus Noun is given in the table below:

S.No.	Result	English	Rules	Dictionary	UNL input
1.	دُپهــــار پتِمپ کیٽْهم مِنٹ /duphari pati ke~h minaʈ/	*few minutes after noon*	tim(%d,N,INV,@paucal;%a,@after):=(%a)(" ")("کیٽْهم")(" ")(" پتِمپ ")(" ")(%d);	[دُپهــــار]{}"noon"(LEX=N,POS=NOU,NUM=SNGT)<kas,0,0>; he is arriving at noon [مِنــــٹ]{}"minute"(LEX=N,POS=NOU,NUM=INV)<kas,0,0>; fifteen minutes	tim(minute.@paucal,noon.@after)
2.	دُپهـــــار بزوٽهم کیٽْهم مِنٹ /duphari brõh ke~h minaʈ/	*few minutes before noon*	tim(%d,N,INV,@paucal;%a,@after):=(%a)(" ")("کیٽْهم")(" ")(" بزوٽهم")(" ")(" ")(%d);	[دُپهـــــار]{}"noon"(LEX=N,POS=NOU,NUM=SNGT)<kas,0,0>; he is arriving at noon [مِنــــٹ]{}"minute"(LEX=N,POS=NOU,NUM=INV)<kas,0,0>; fifteen minutes	tim(minute.@paucal,noon.@before)
3.	دُپهـــار پیٽْهمپ کیٽْهم مِنٹ	*few minutes*	tim(%d,N,INV,@paucal;%a,@after):=(%a)("	[دُپهـــــار]{}"noon"(LEX=N,POS=NOU	tim(minute.@paucal,noon.@

S.No.	Result	English	Rules	Dictionary	UNL input
	/dupharɨ pⁱaʈɨ ke~h minaʈ/	*from noon*	")("پيٹھ")(" ")("كِيْنٗم~")(" ")(%d);	U,NUM=SNGT)<kas,0,0>; he is arriving at noon [مِنٹ]{}"minute" (LEX=N,POS=NOU,NUM=INV)<kas,0,0>; fifteen minutes	from)

4.9 NLisation of Conjunctions

The generation of Noun plus Conjunction plus Noun is explained in the below given table:

S.No.	Result	English	Rules	Dictionary	UNL input
1.	جـــان تــم میری /dʒaːn tɨ meːriː/	*John and Mary*	and(%b,N;%a,N):=(%a)(" ")("تٖم")(" ")(%b);	[جـــان]{}"John"(LEX=N,POS=PPN)<kas,0,0>; [تٖم]{}"" (LEX=C,POS=CCJ,rel=and)<kas,255,0>; John and Mary [میــری]{}"Mary"(LEX=N,POS=PPN)<kas,0,0>;	and (Mary, John)
2.	فاطمــہ تٖم آمِر /fatimaː tɨ aːmir/	*Fatima and Aamir*	and(%b,N;%a,N):=(%a)(" ")("تٖم")(" ")(%b);	[فاطمـہ]{}"Fatima"(LEX=N,POS=PPN)<kas,0,0>; [تٖم]{}"" (LEX=C,POS=CCJ,rel=and)<kas,255,0>; John and Mary [آمِـر]{}"Aamir"(LEX=N,POS=PPN)<kas,0,0>;	and (Aamir, Fatima)

Conclusion

EUGENE is an analytic tool in the UNL programme. This work involved the NLisation of the UNLised corpus by employing EUGENE. This was done by framing UNL- NL dictionary entries for all the nodes of the derived UNL graphs. After that, paradigms and the required generation rules were framed. This work is a pioneering work in terms of application of EUGENE for the generation of UNLised text and the efficiency of this system can be further enhanced by incorporating more corpus, and framing corresponding dictionary, paradigms, and rules.

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شبکه‌سازی زبان با تولیدکننده ساختار ژرف‌ساخت به روساخت:
رویکرد جهانی شبکه زبان

سمیره نبی [۱]

دکترای زبان‌شناسی، استادیار انستیتوی ملی فناوری (قراردادی)،
سرناگر، جامو و کشمیر، هند.

نیلوفرحسین وانی [۲] ©

استادیار بخش زبان انگلیسی، دانشگاه شاه خالد،
أبها، عربستان سعودی.

به گفته یوچیدا و همکاران (۲۰۰۱) «زبان شبکه جهانی، یک زبان رایانه‌ای است که جهت نمایش و پردازش اطلاعات از طریق موانع زبانی ایجاد شده» فرآیند تجزیه متن و تبدیل متن توسط دو مؤلفه سیستم زبان شبکه جهانی یعنی (تحلیل‌گر تعاملی) و (تولیدکننده ساختار ژرف‌ساخت به روساخت) انجام می‌شود. هدف از تحقیق حاضر، اجرای ابزار تولیدکننده ساختار ژرف‌ساخت به روساخت برای شبکه‌سازی پیکره UCA-1 (پیکره در سایت www.unlweb.net موجود) است. این کار نخستین تلاش جدی جهت گنجاندن زبان کشمیری در زبان شبکه جهانی است، بنابراین راهی جهت توسعه سیستم ترجمه ماشینی زبان کشمیری فراهم می‌آورد.

واژه‌های کلیدی: زبان شبکه جهانی، شبکه‌سازی، زبان کشمیری.

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