

FLOW-CHART OF ŚĀBDA-BODHA

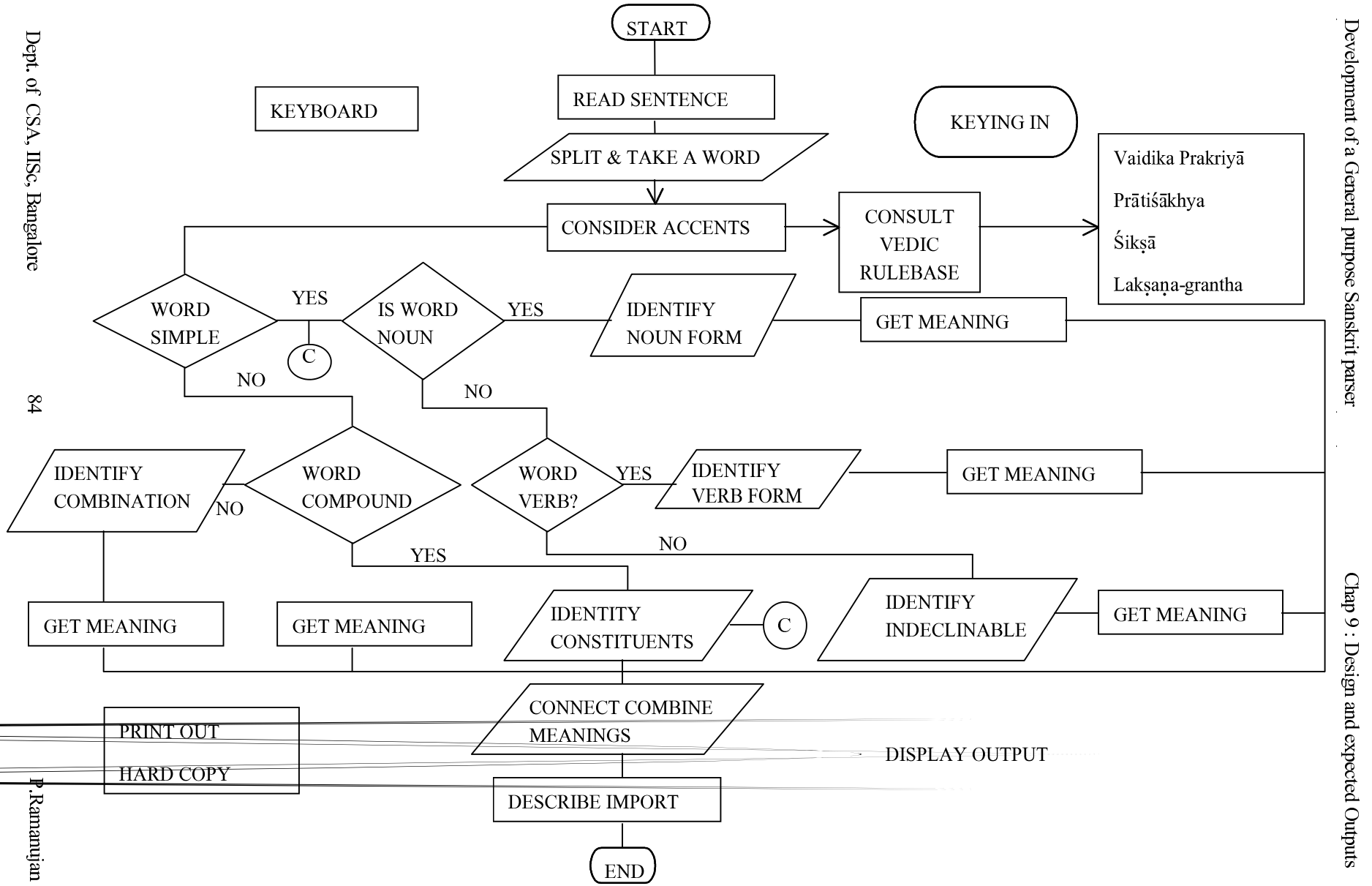


Figure 9.1

Morphological Analysis of Accented Input

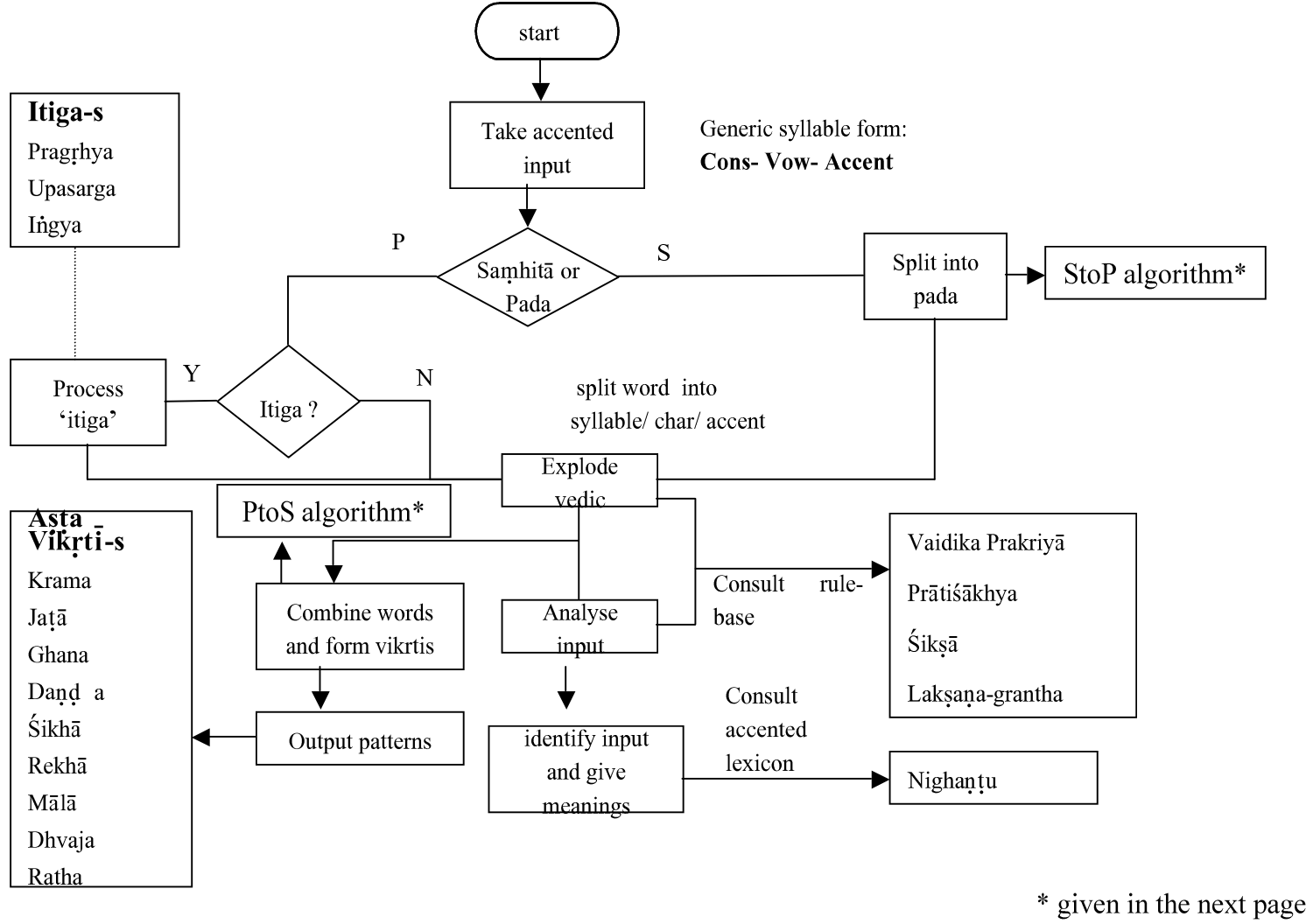


Figure 9.2

Vedic Syllable Syntax - ISCII code syntax extension [S = Svvara R = Non-Svvara]

Vedic-Syllable ::= Vedic-Cons-Vowel-Syllable | Vedic-Cons-Vowel-Syllable | Full-Vedic-Syllable

Vedic-Cons-Vowel-Syllable ::= Cons-Vowel-Syllable S

Vedic-Vowel-Syllable ::= Vowel-Syllable S

Full-Vedic-Syllable ::= R S

A) Samhita to Padapatha - StoP Algorithm

- 1) convert svarita & pracaya-s to anudāttā
- 2) Expand Īṅya-s, add iti and rewrite separately
- 3) With udāttā-s as pivot, accent each syllable
- 4) If there are any jātya (nitya) svaritā-s, write it as it is.
- 5) Undo any sandhis in saṁhitā (prose) form & write pausa form cerebralization / elongation non-sandhi etc.
- 6) Other specialities of pada-pāṭha to be added. Itiga-s

B) Pada Pāṭha to Samhita PtoS Algorithm

- 1) dissolve all special features of pada-pāṭha
- 2) make anudāttā-s all svarita-s and pracaya
- 3) combine words make sandhi euphonically as per rule base.
- 4) making udāttā-s fixed, complete accent marking
- 5) hrasva / dīrgha kampa-s are to be placed appropriately
- 6) carry out elongation cerebralization etc.

e.g. śrūdhi in saṁhitā; śrudhi in padapāṭha

Figure 9.3

FLOW CHART FOR MORPHOLOGICAL VALIDATION

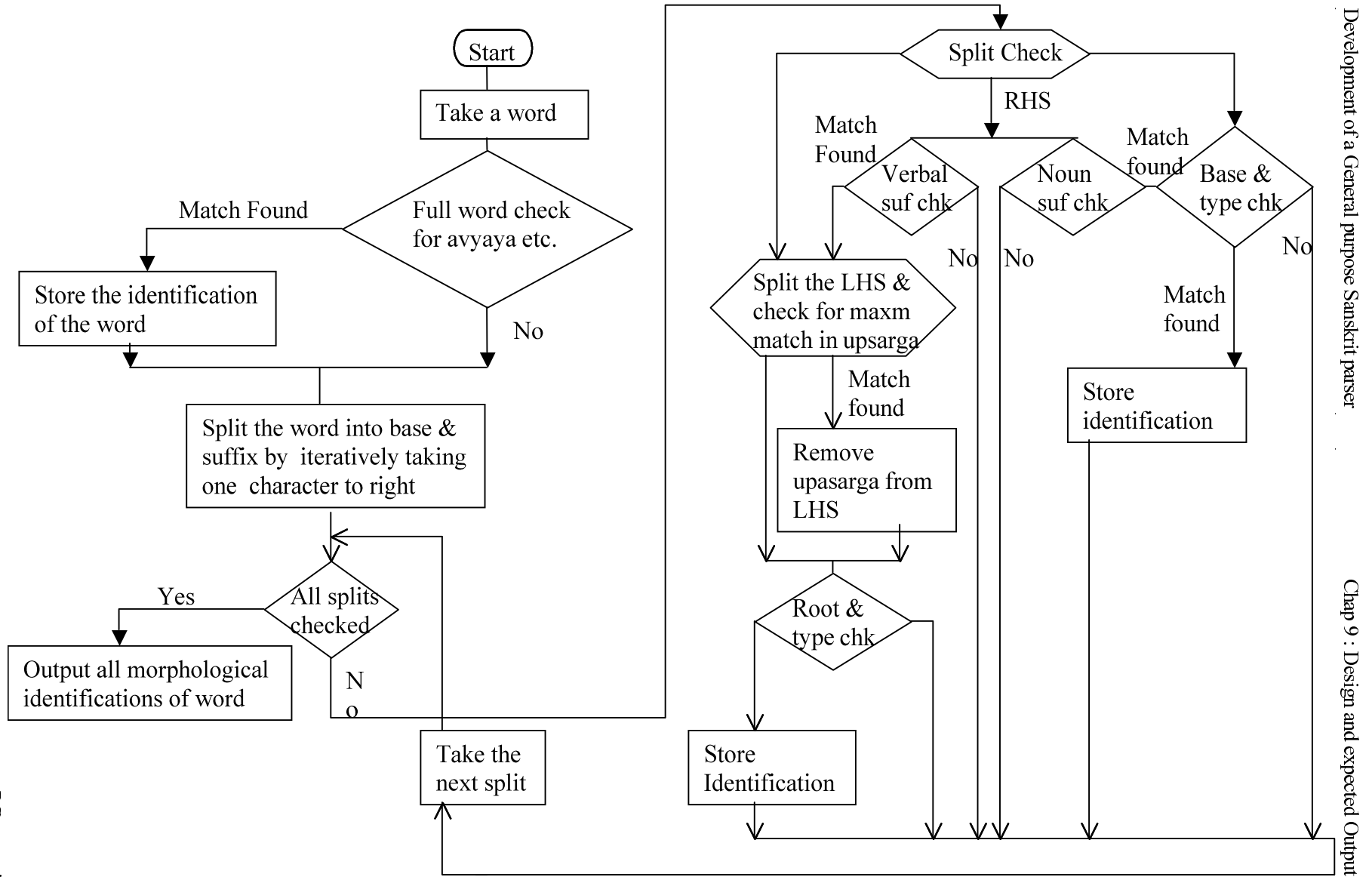


Figure 9.5

Expectancy based Syntactic Analyser

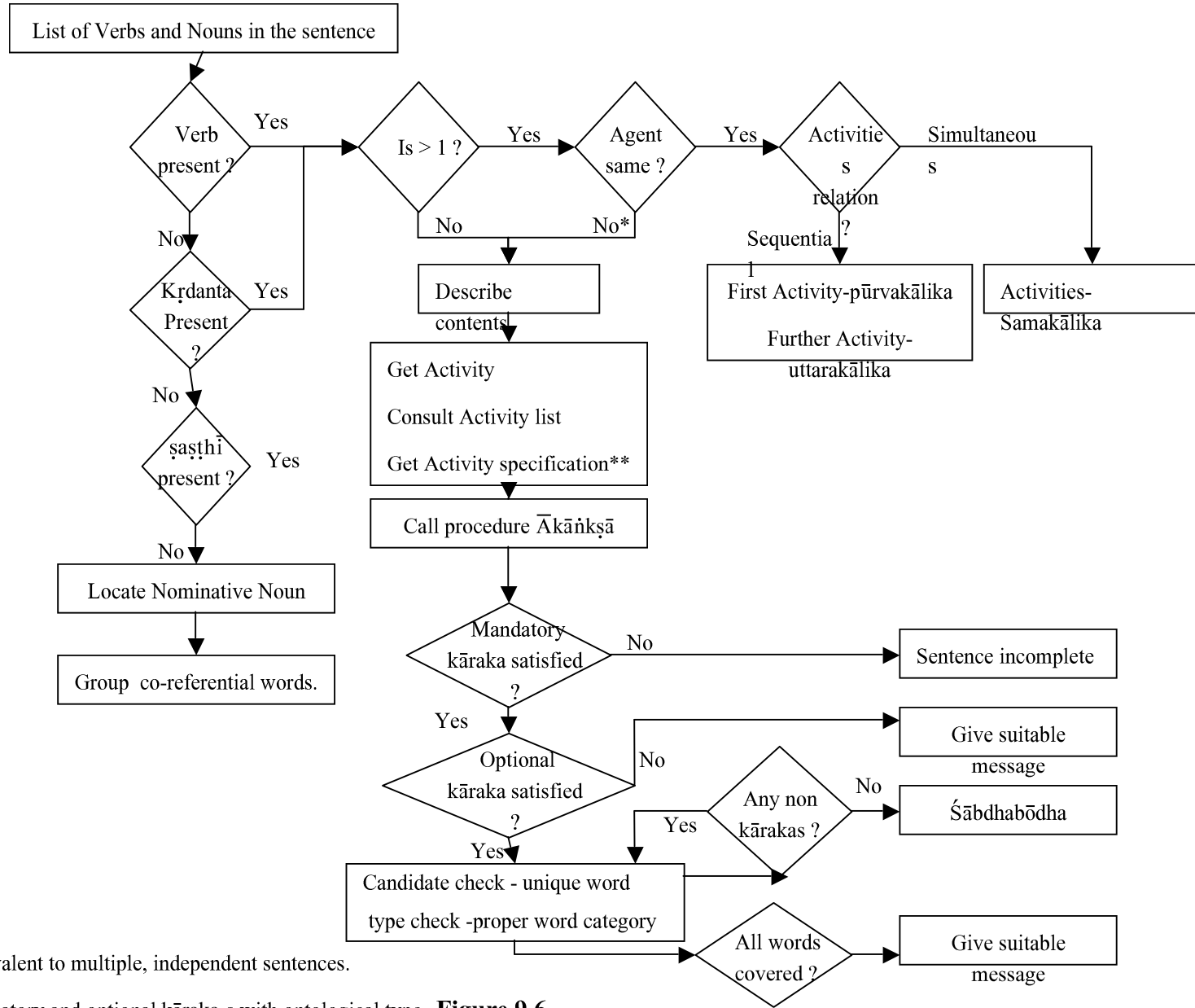
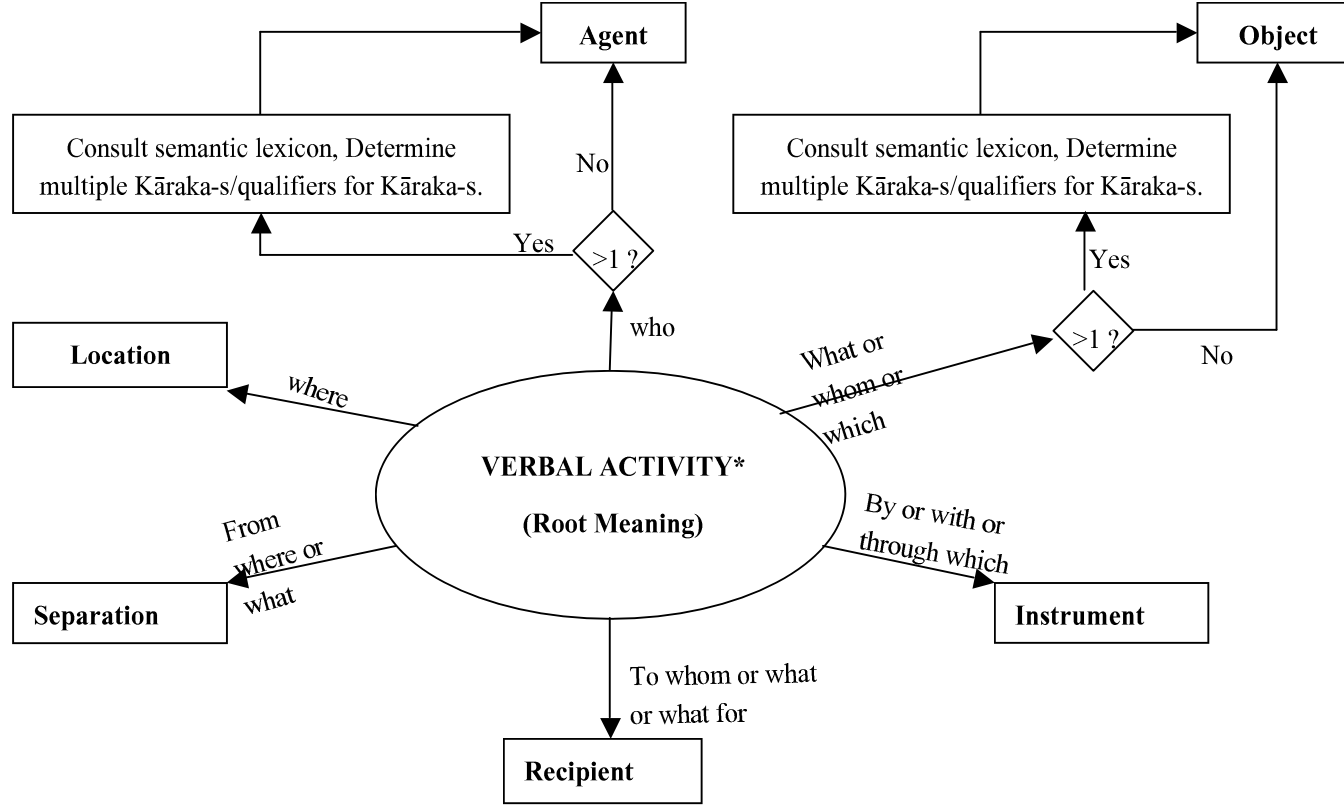


Figure 9.6

Procedure Ākāṅkṣā



Note : * - If no activity marker, I.e., Verb or Kṛdanta or multiple activities - refer to syntactic analyser.

Figure 9.7

Classification of Sanskrit Case endings (Vibhakti) [Aṣṭādhyāyī 2.3.1 - 2.3.73]

Vibhakti Sub Types

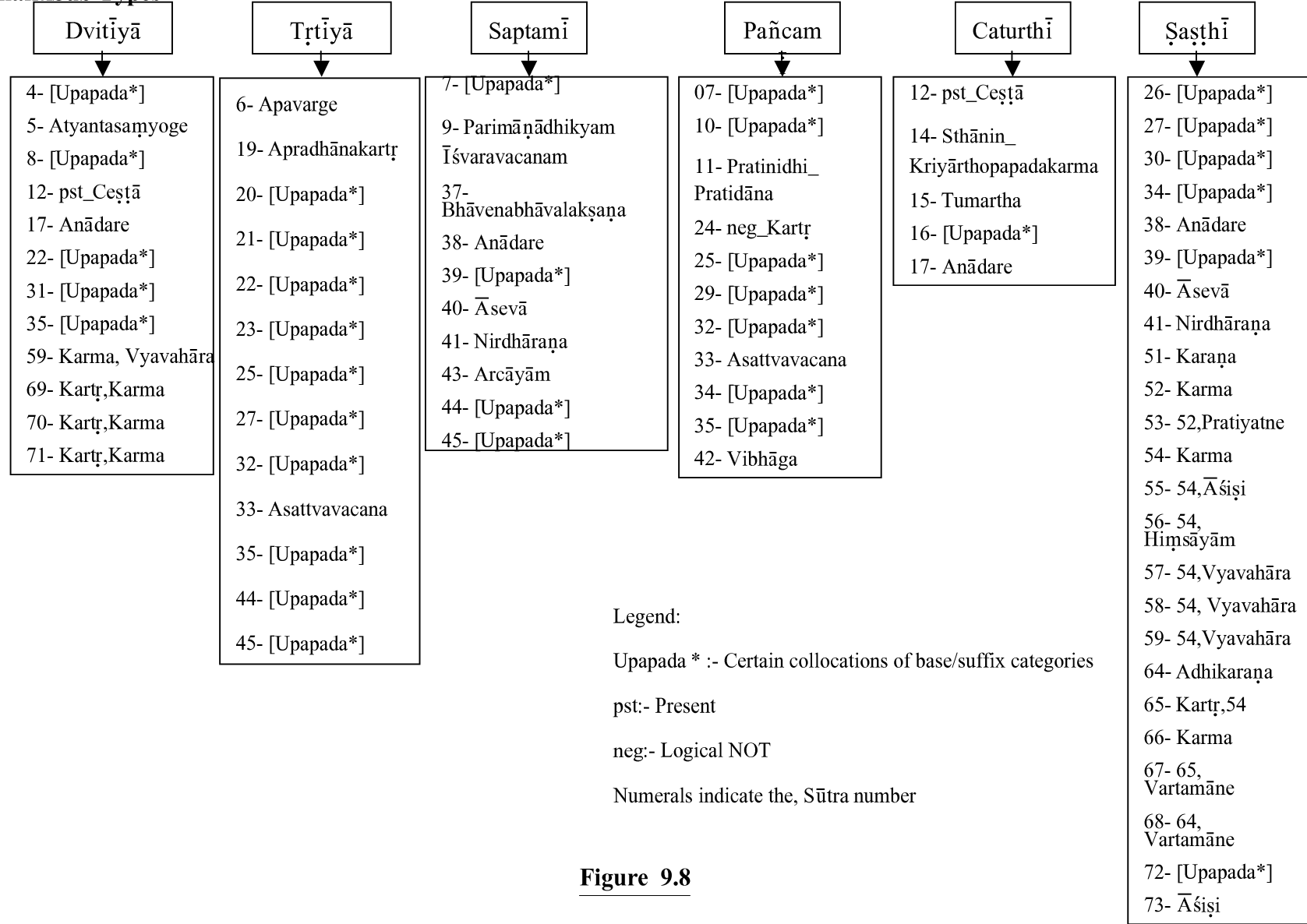


Figure 9.8

Syntactic conditions to identify Second case ending Sub Type

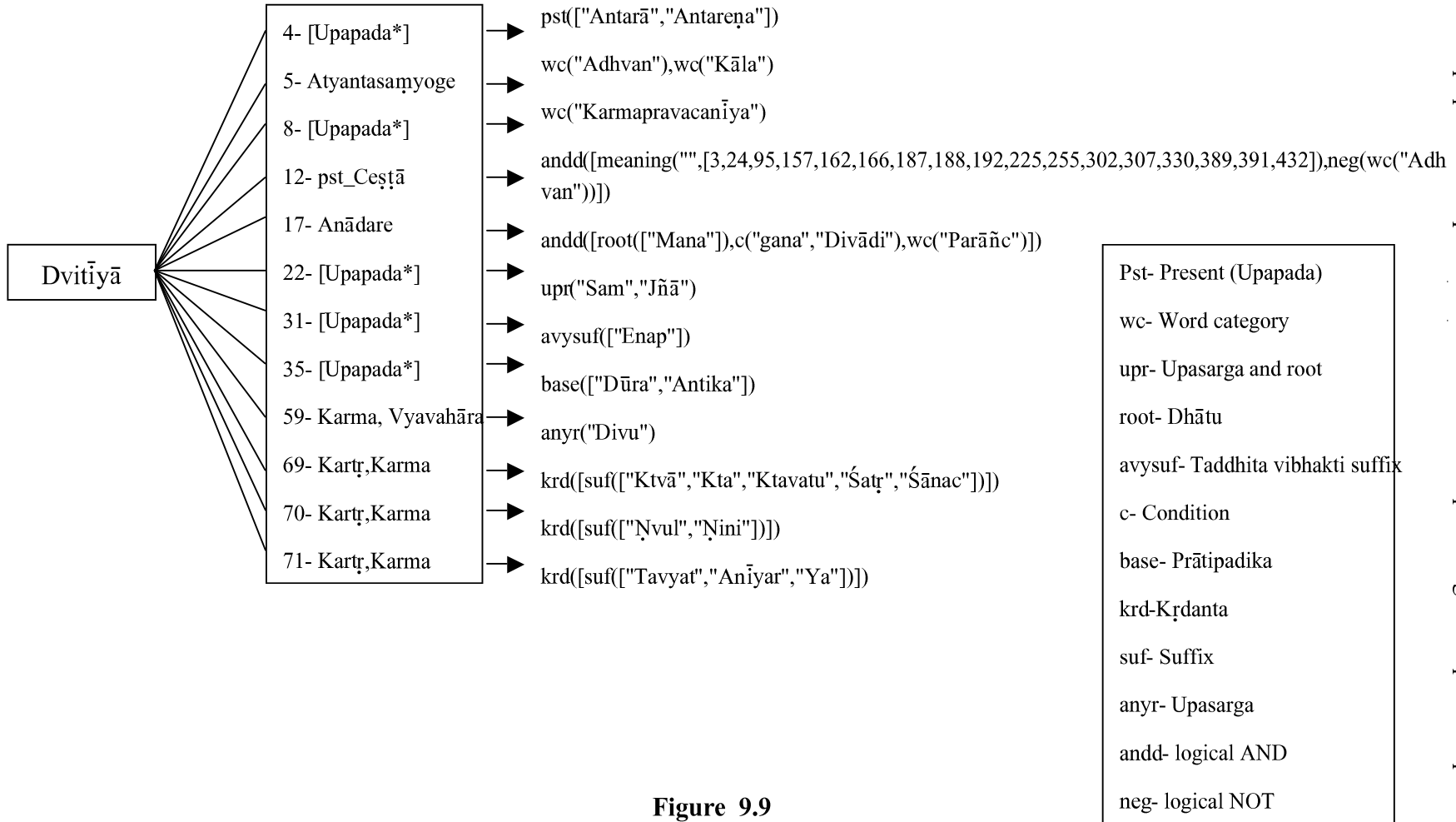


Figure 9.9

Syntactic conditions to identify Third case ending Sub Type

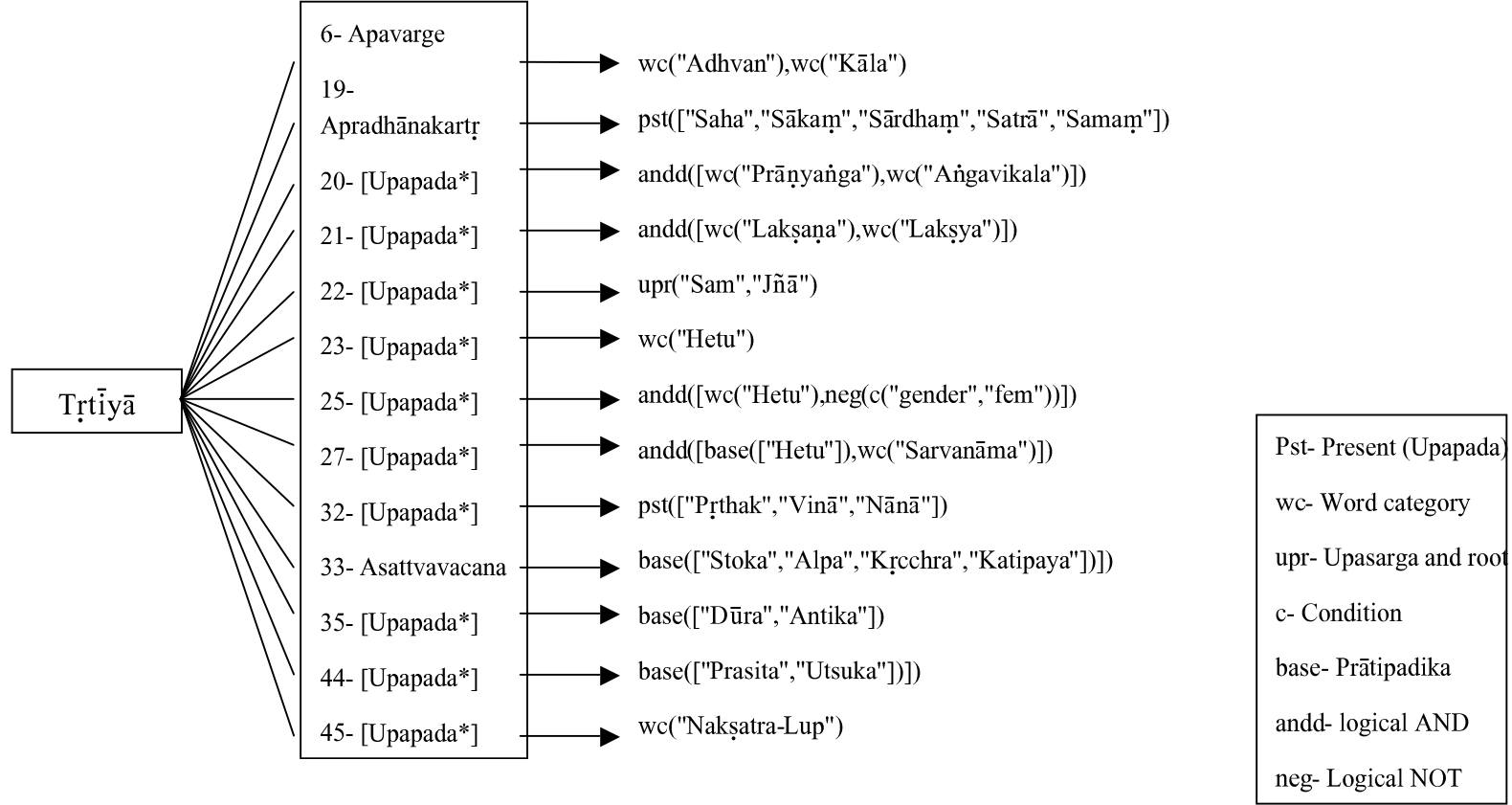


Figure 9.10

Syntactic conditions to identify Seventh case ending Sub Type

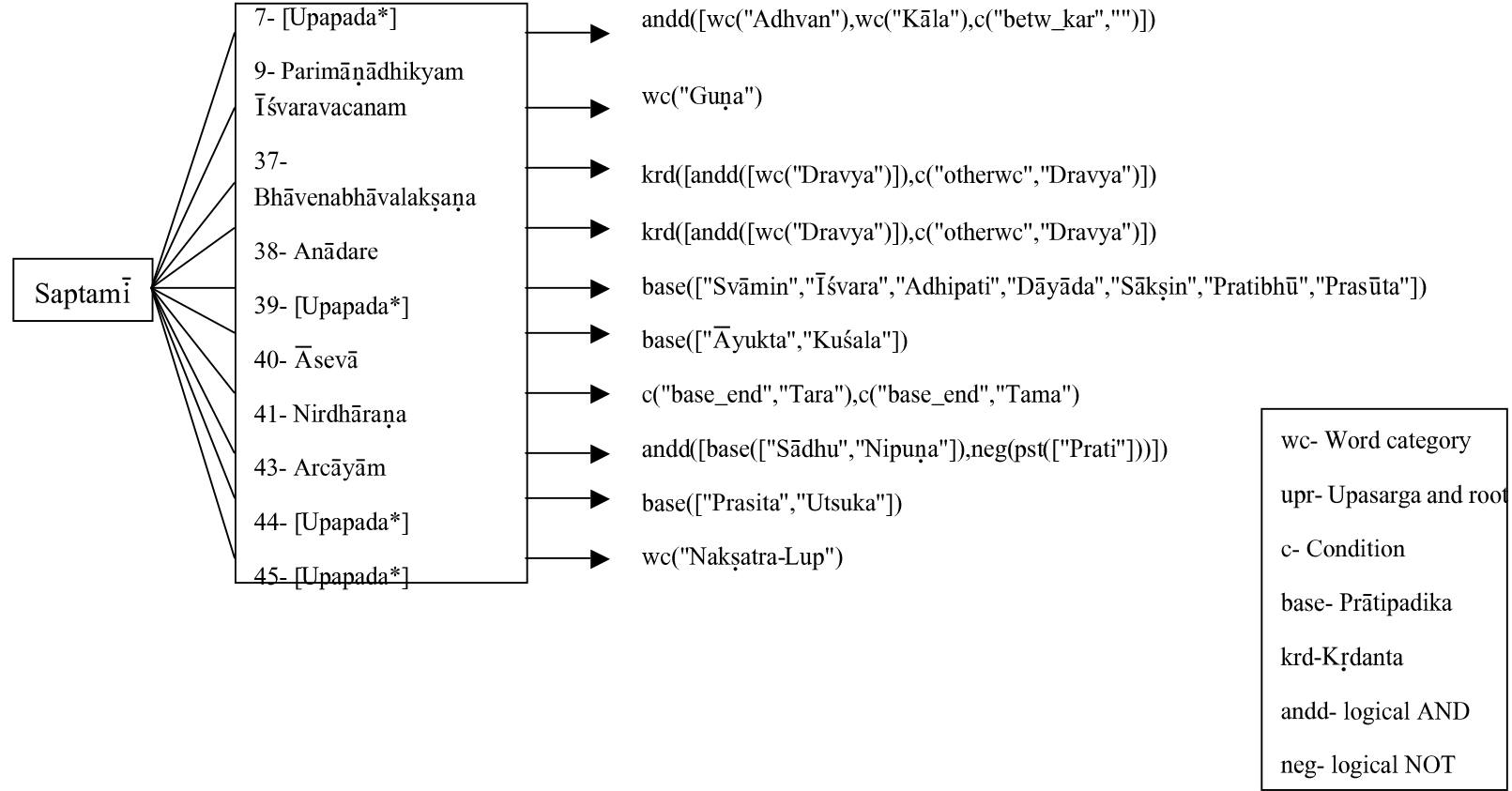


Figure 9.11

Syntactic conditions to identify Fifth case ending Sub Type

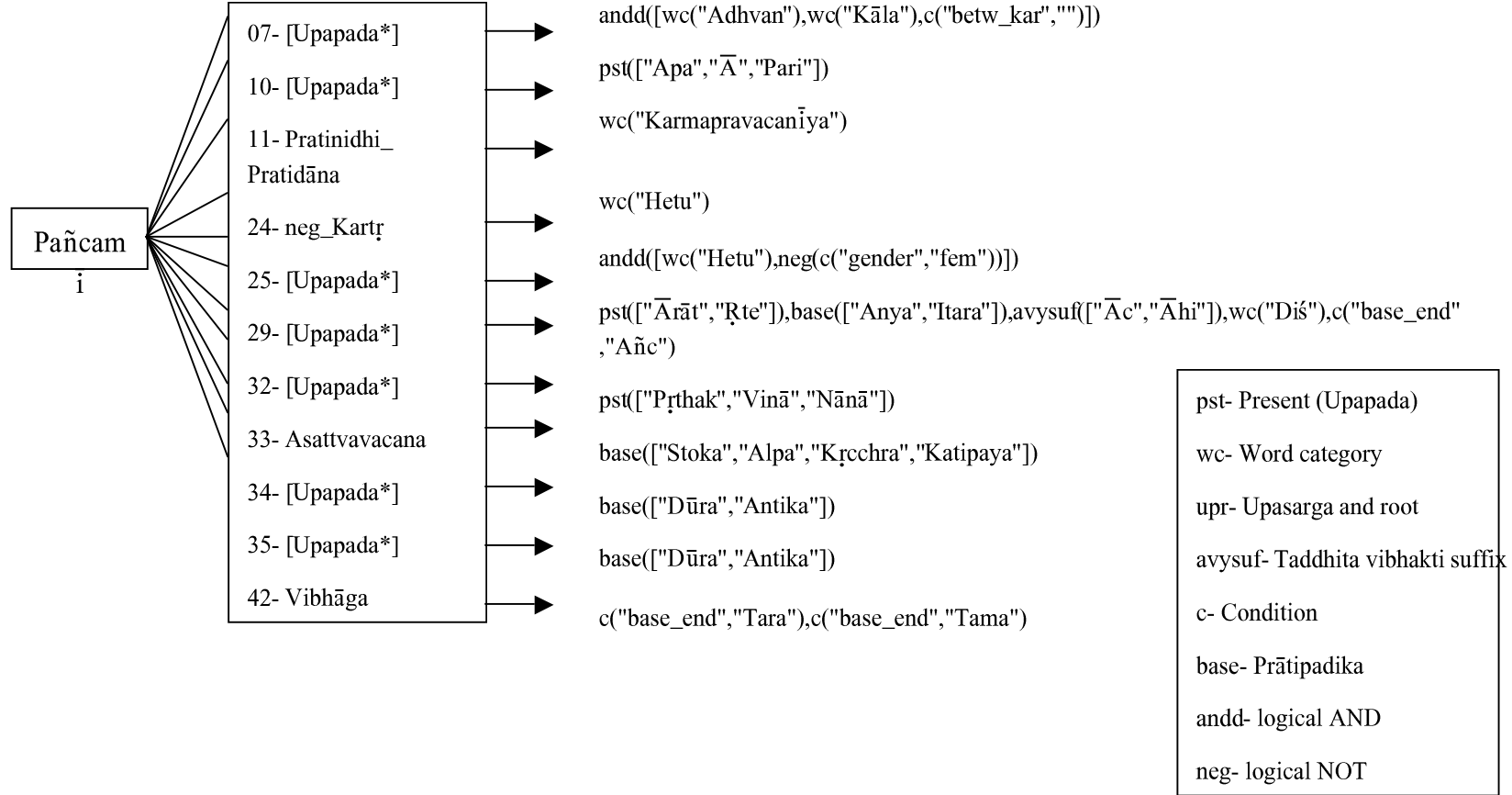


Figure 9.12

Syntactic conditions to identify Fourth case ending Sub Type

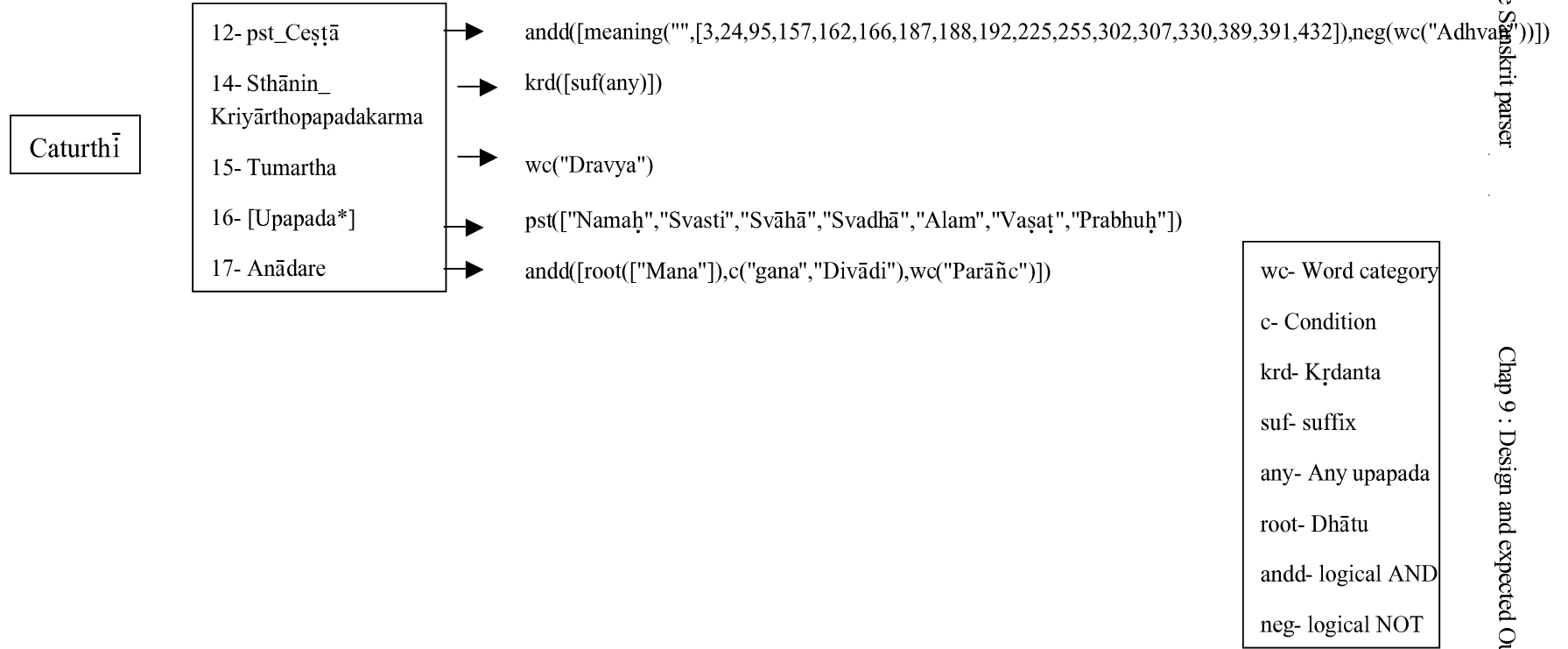


Figure 9.13

Syntactic conditions to identify Sixth case ending Sub Type

Development of a General purpose Sanskrit parser

Chap 9 : Design and expected Outputs

Ṣaṣṭhī

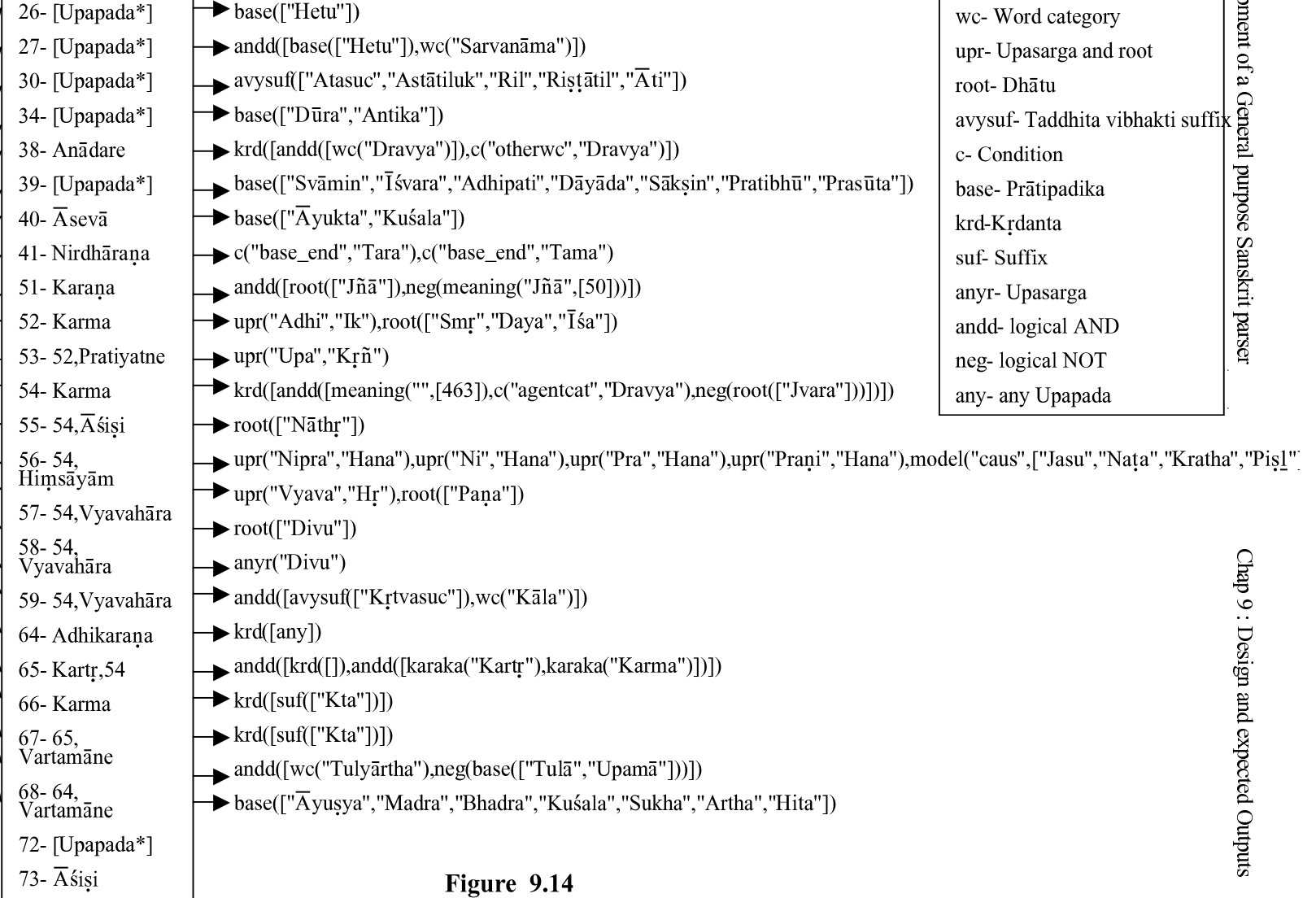


Figure 9.14

Chart of Kāraka subtypes

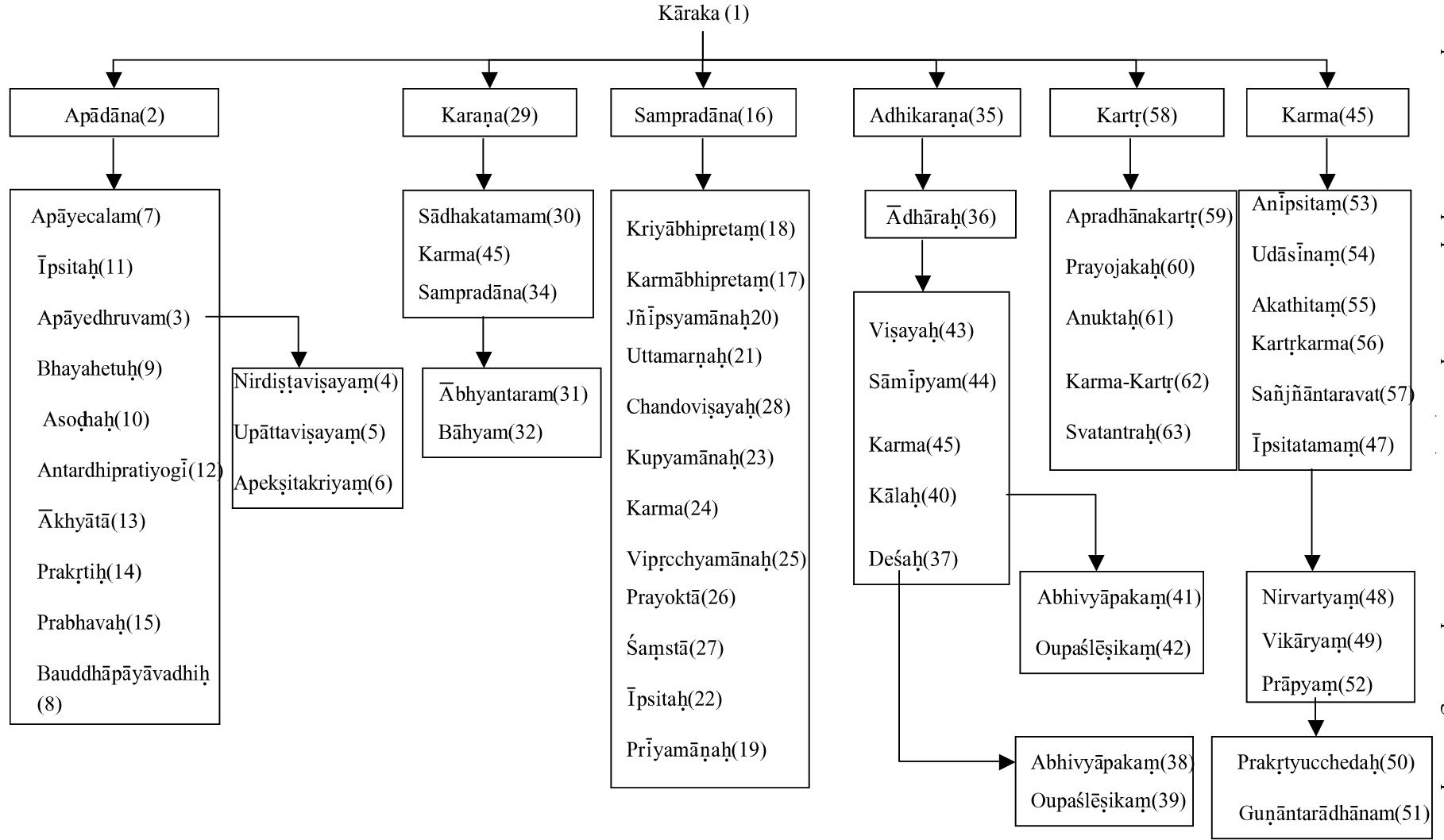


Figure 9.15

Conditions for Apādāna Kāraka subtypes

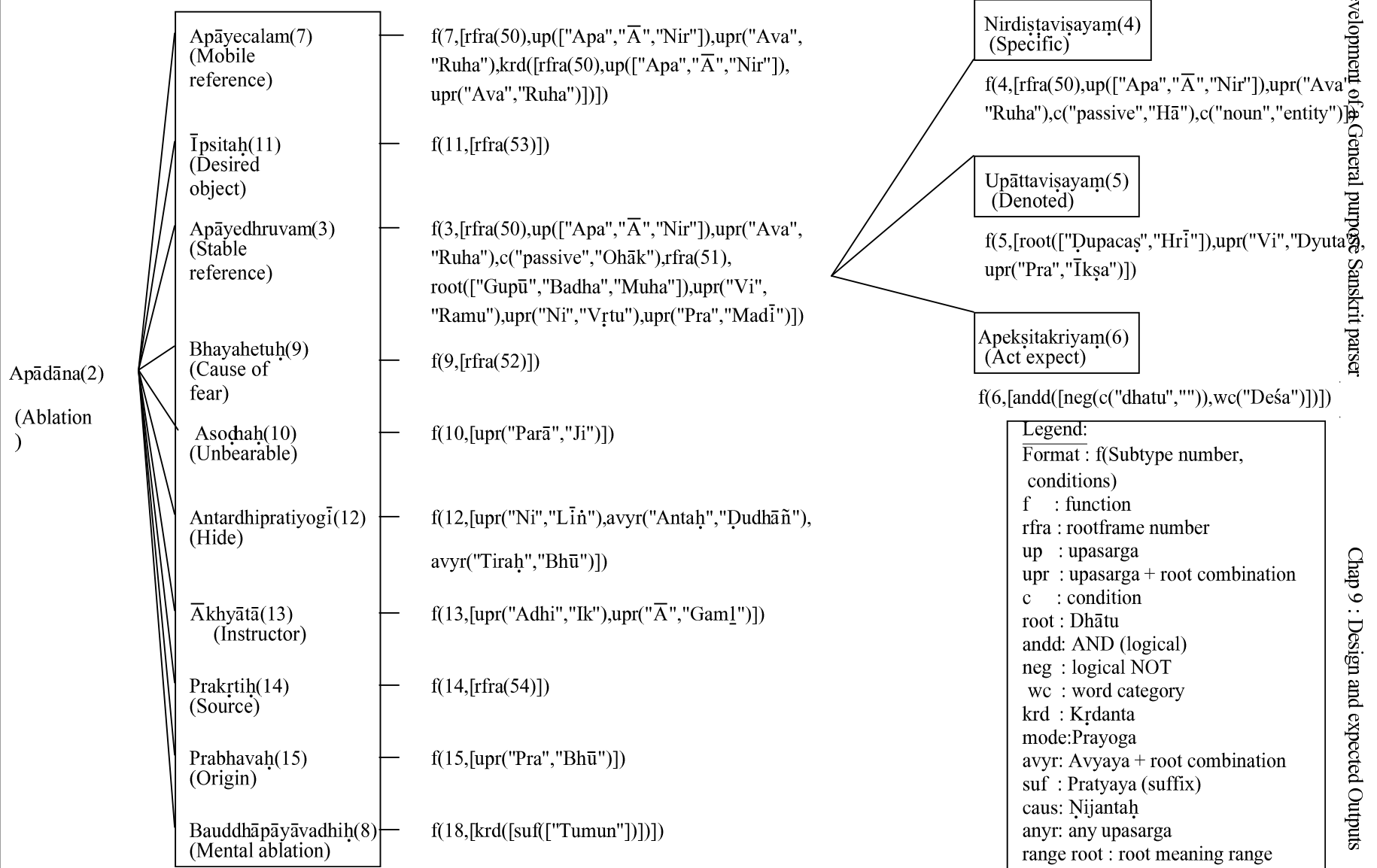
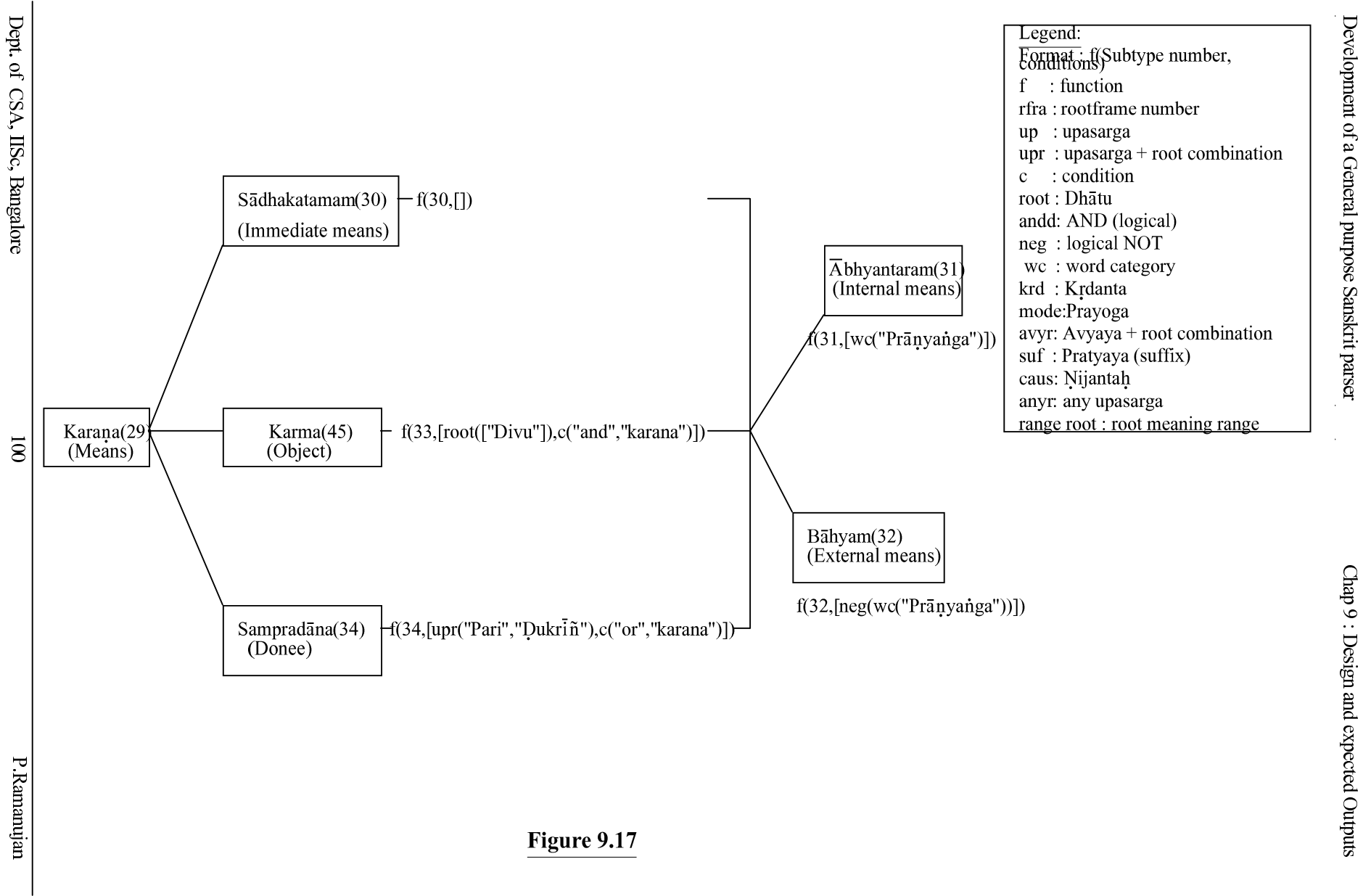


Figure 9.16

Conditions for Karaṇa Kāraka subtypes



Conditions for Sampradāna Kāraka subtypes

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Sampradāna(16)

P. Ramanujan

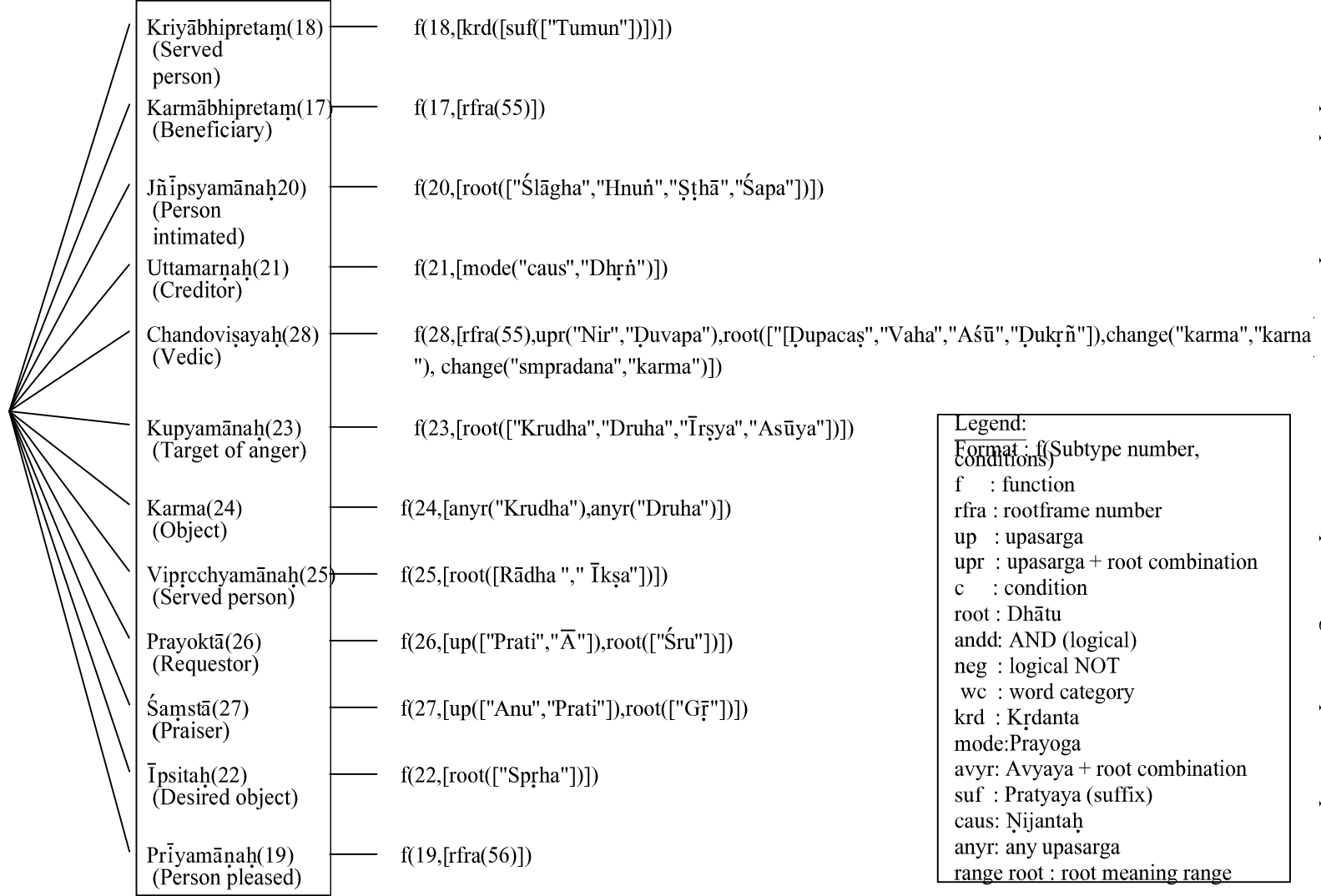


Figure 9.18

Conditions for Adhikaraṇa Kāraka subtypes

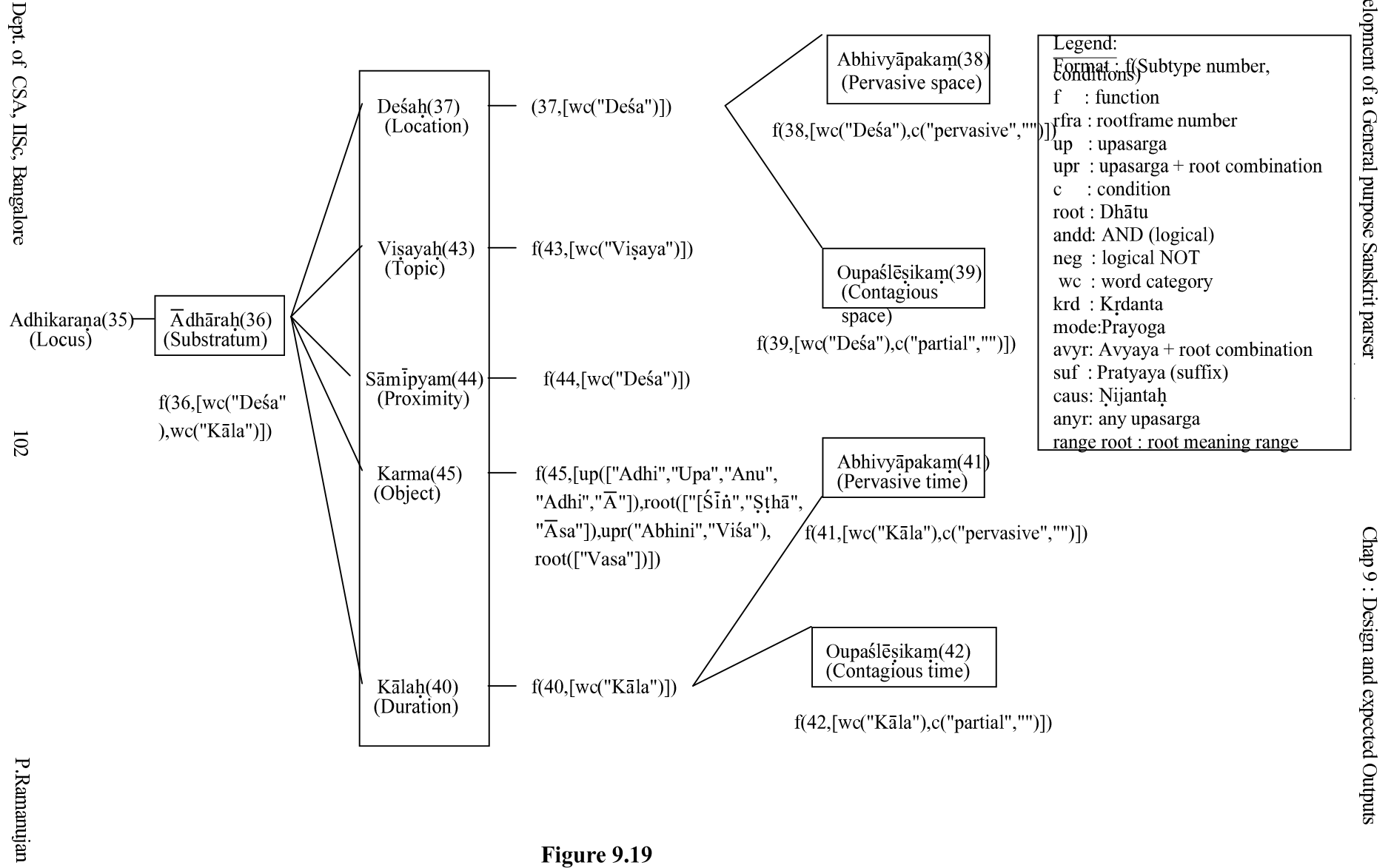
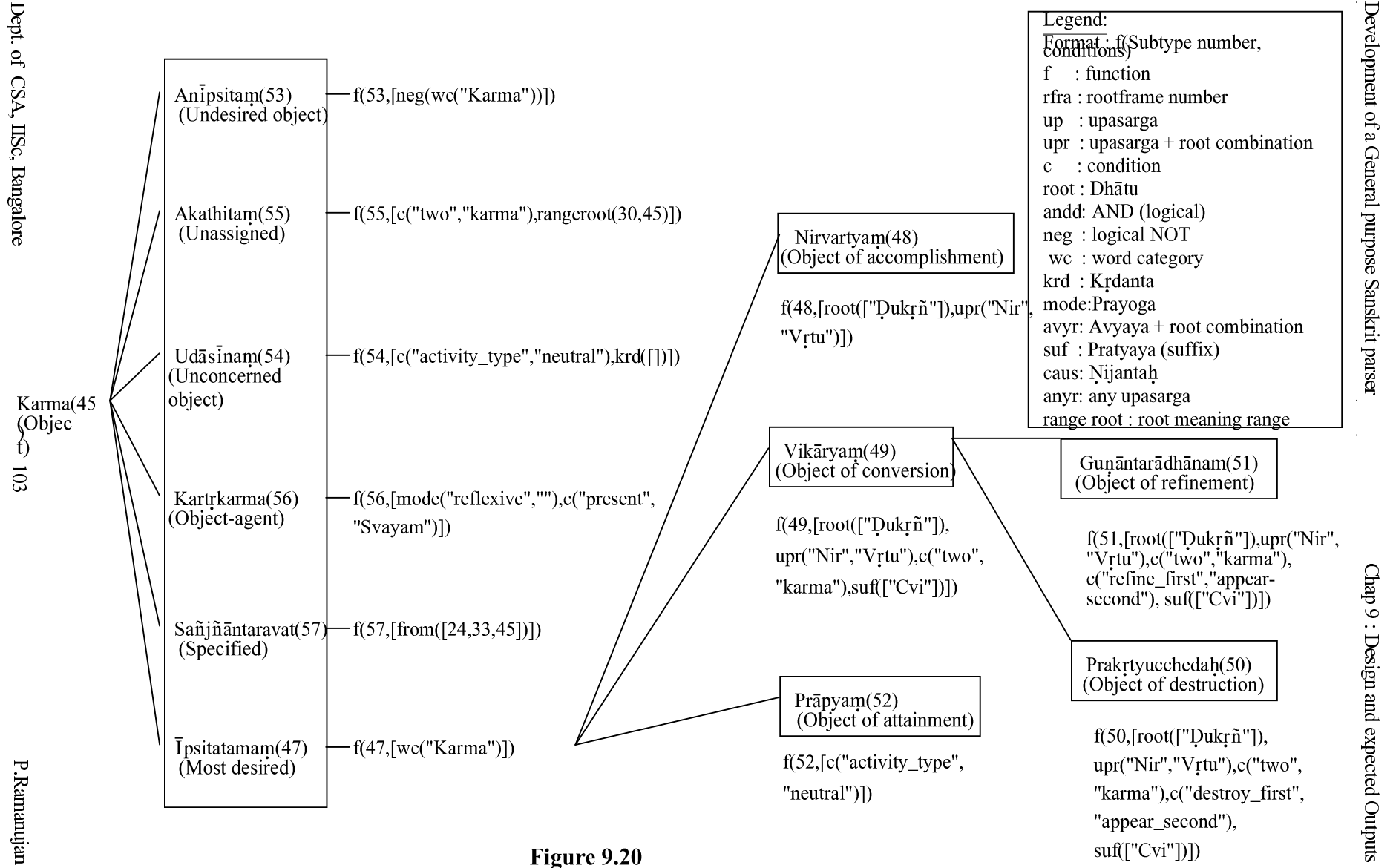


Figure 9.19

Conditions for Karma Kāraka subtypes



Conditions for Kartṛ Kāraka subtypes

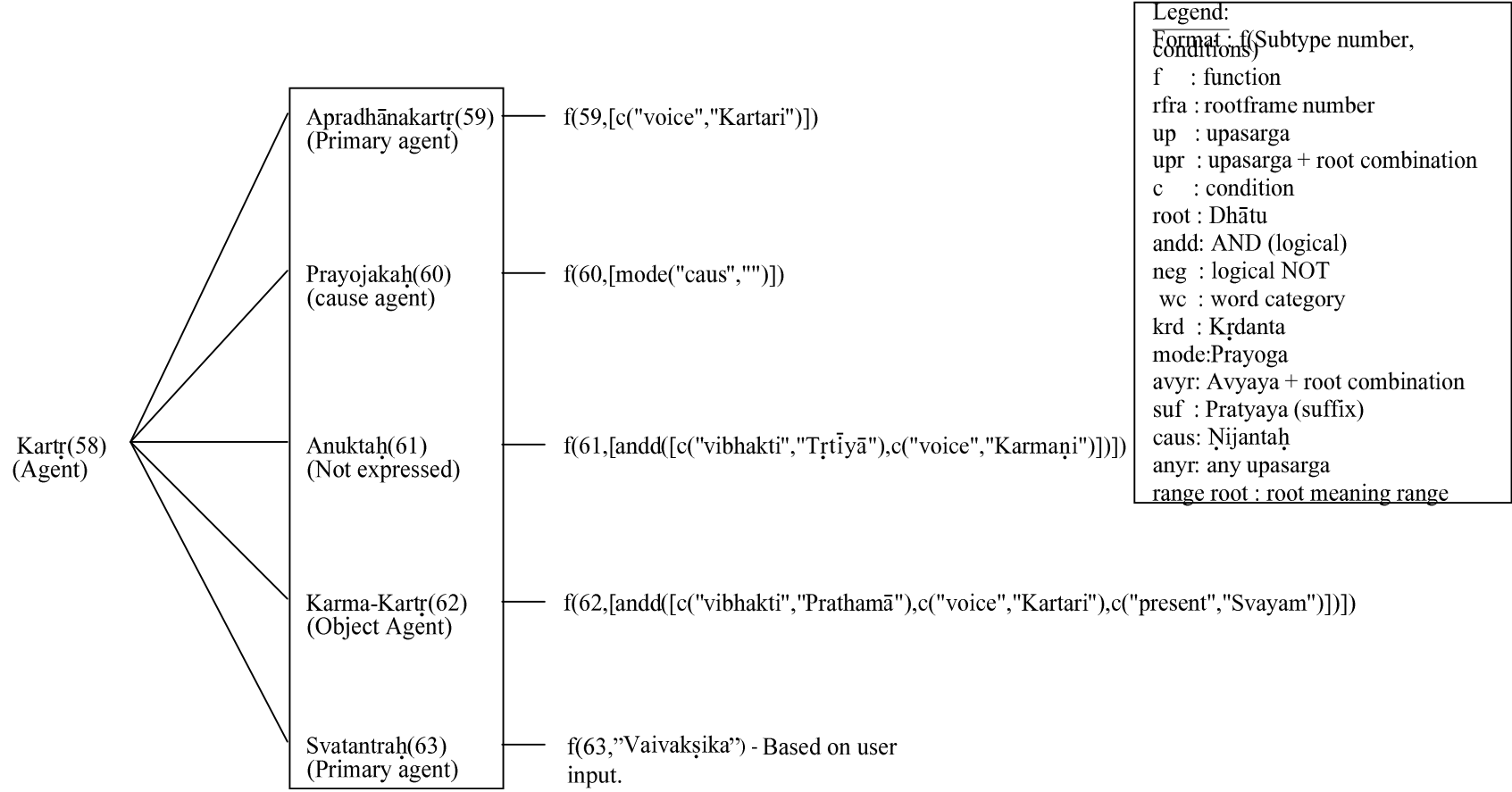


Figure 9.21

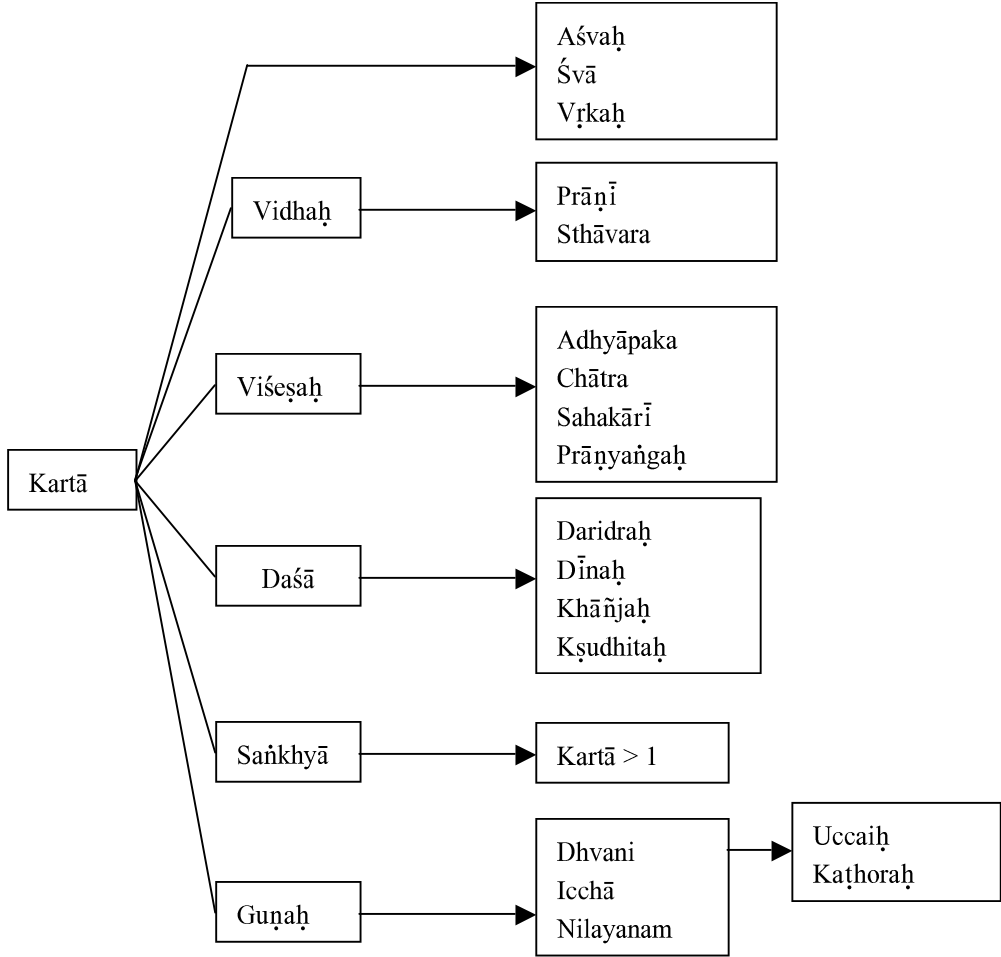


Figure 9.22

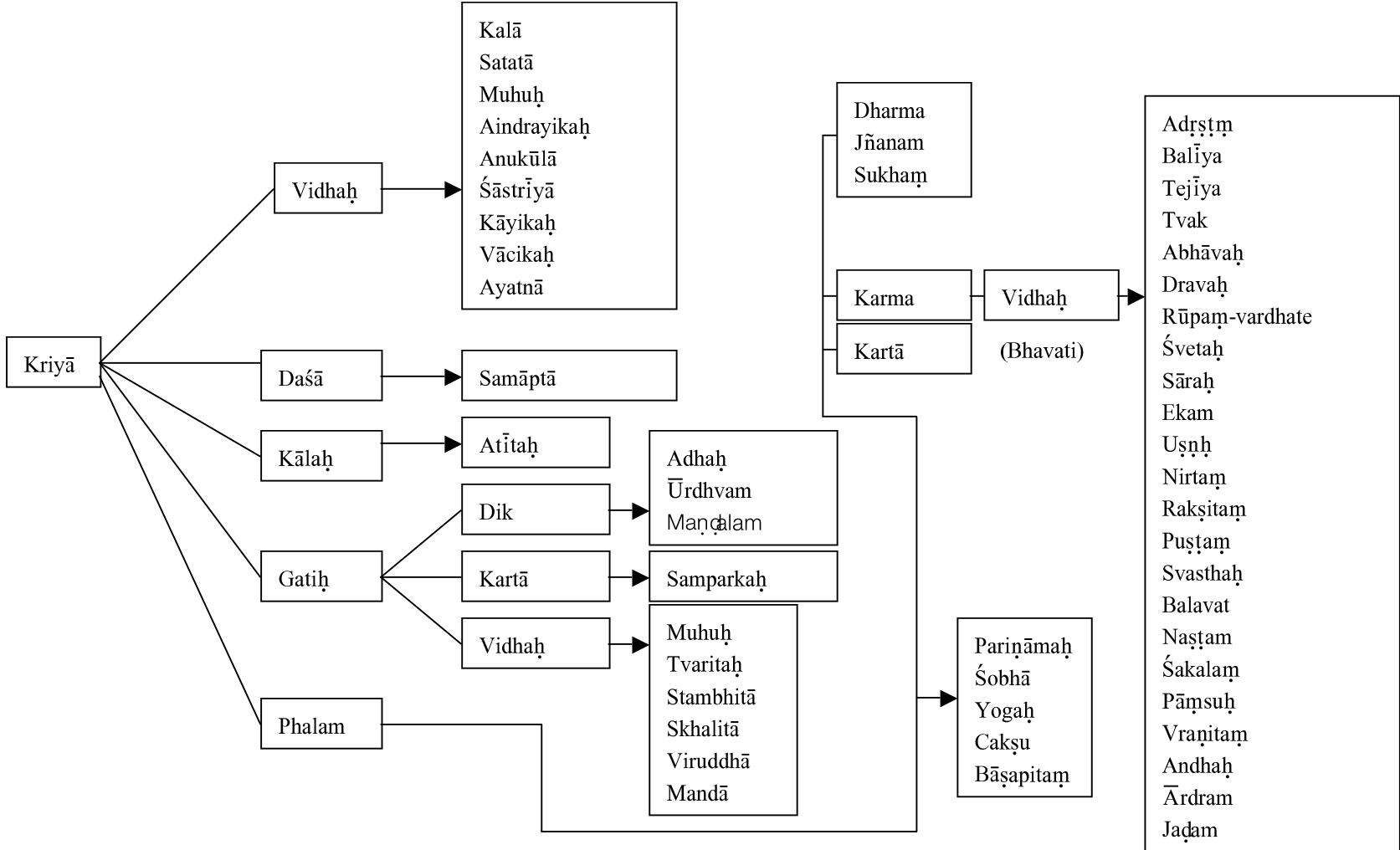
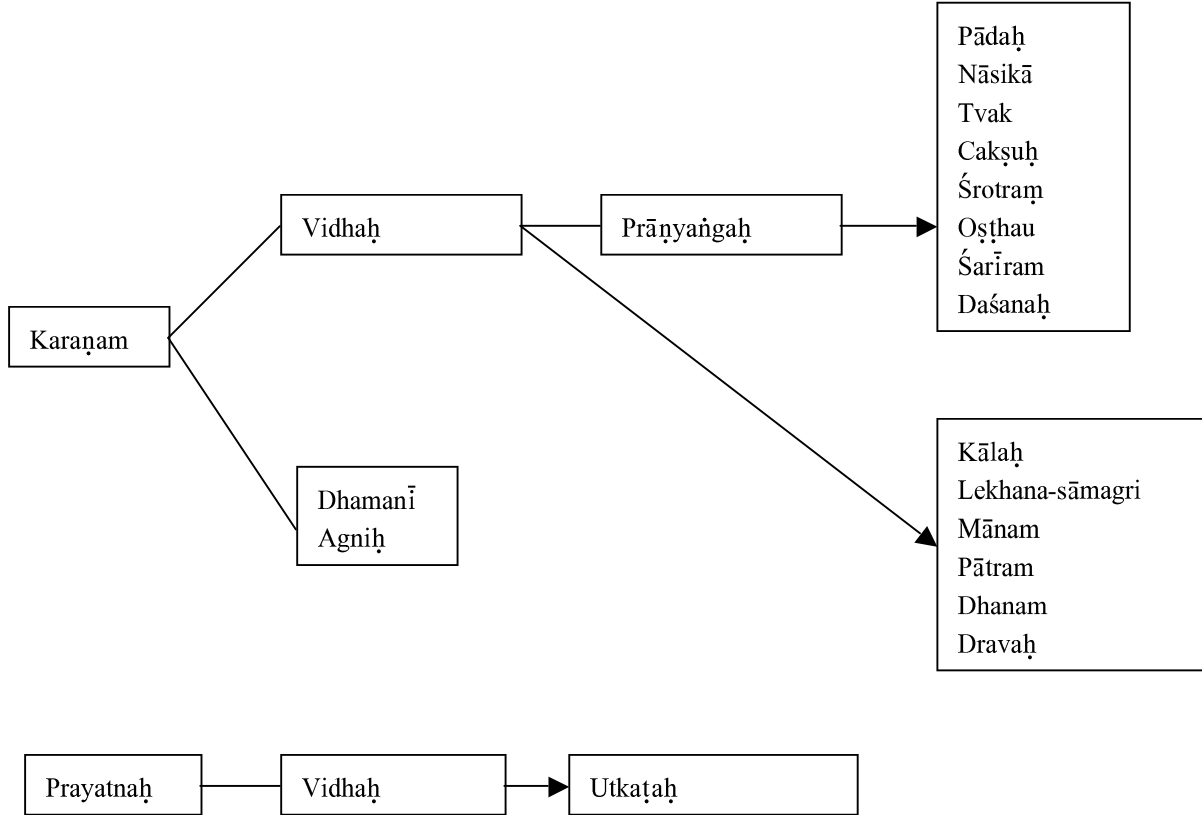


Figure 9.23

**Figure 9.24**

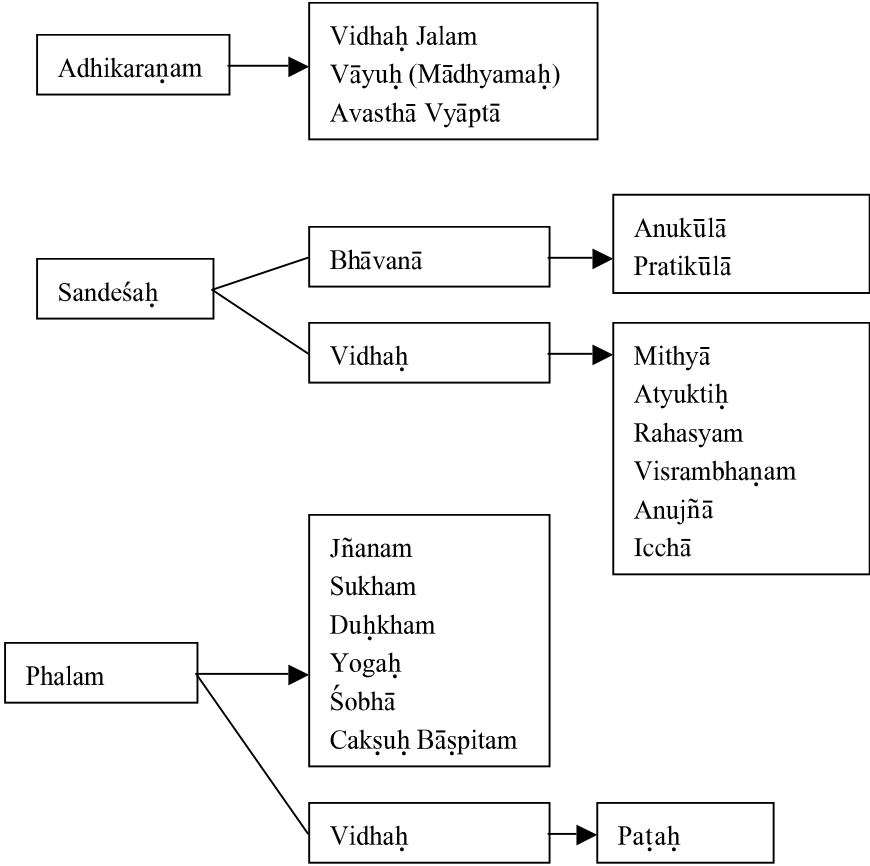


Figure 9.25

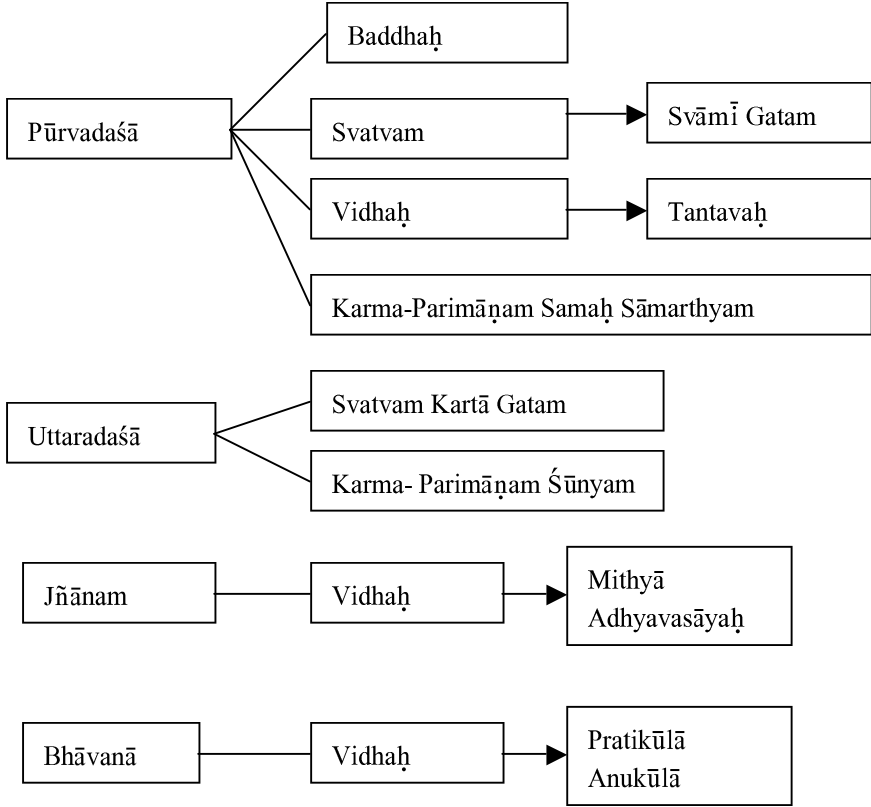
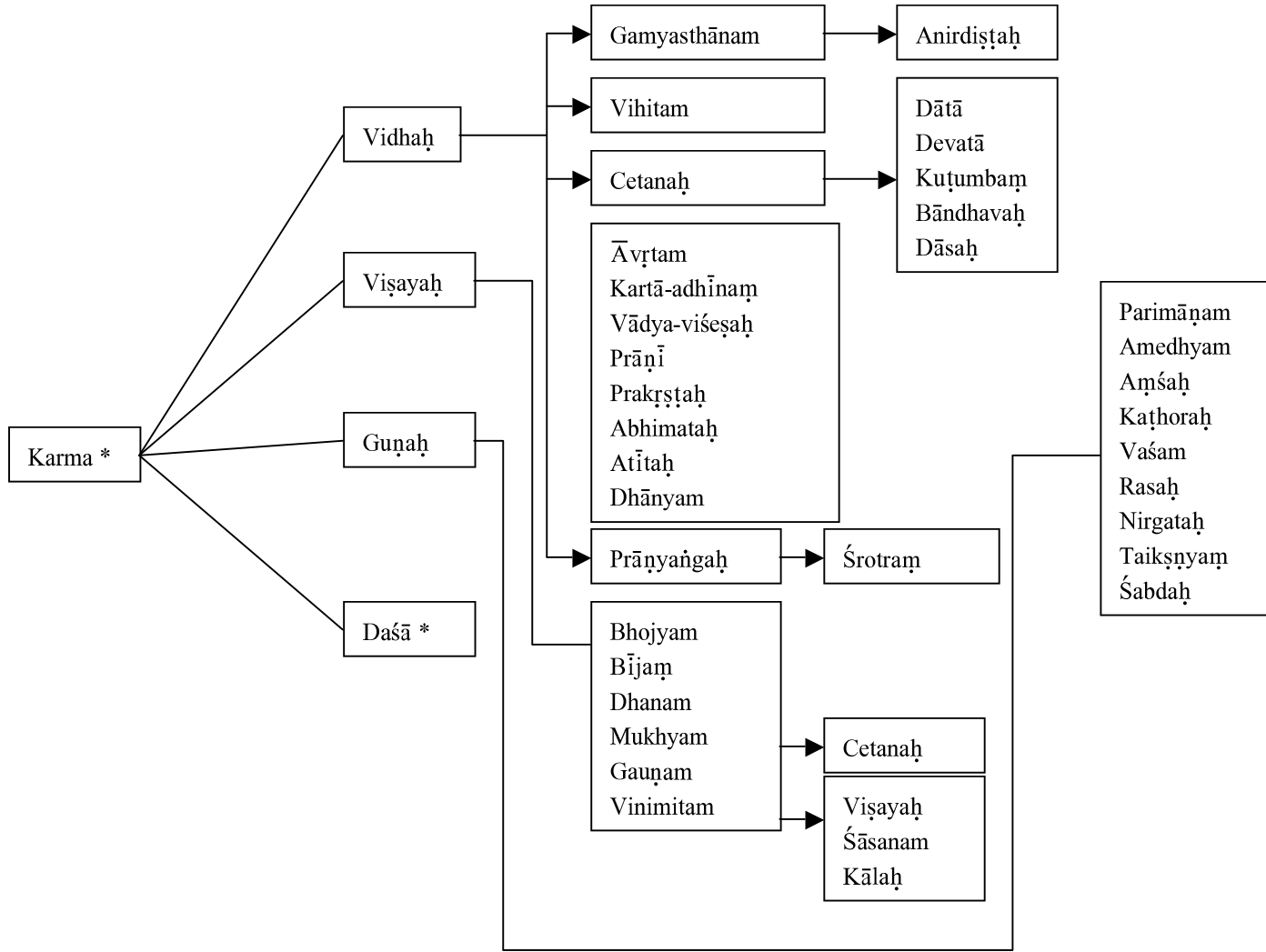
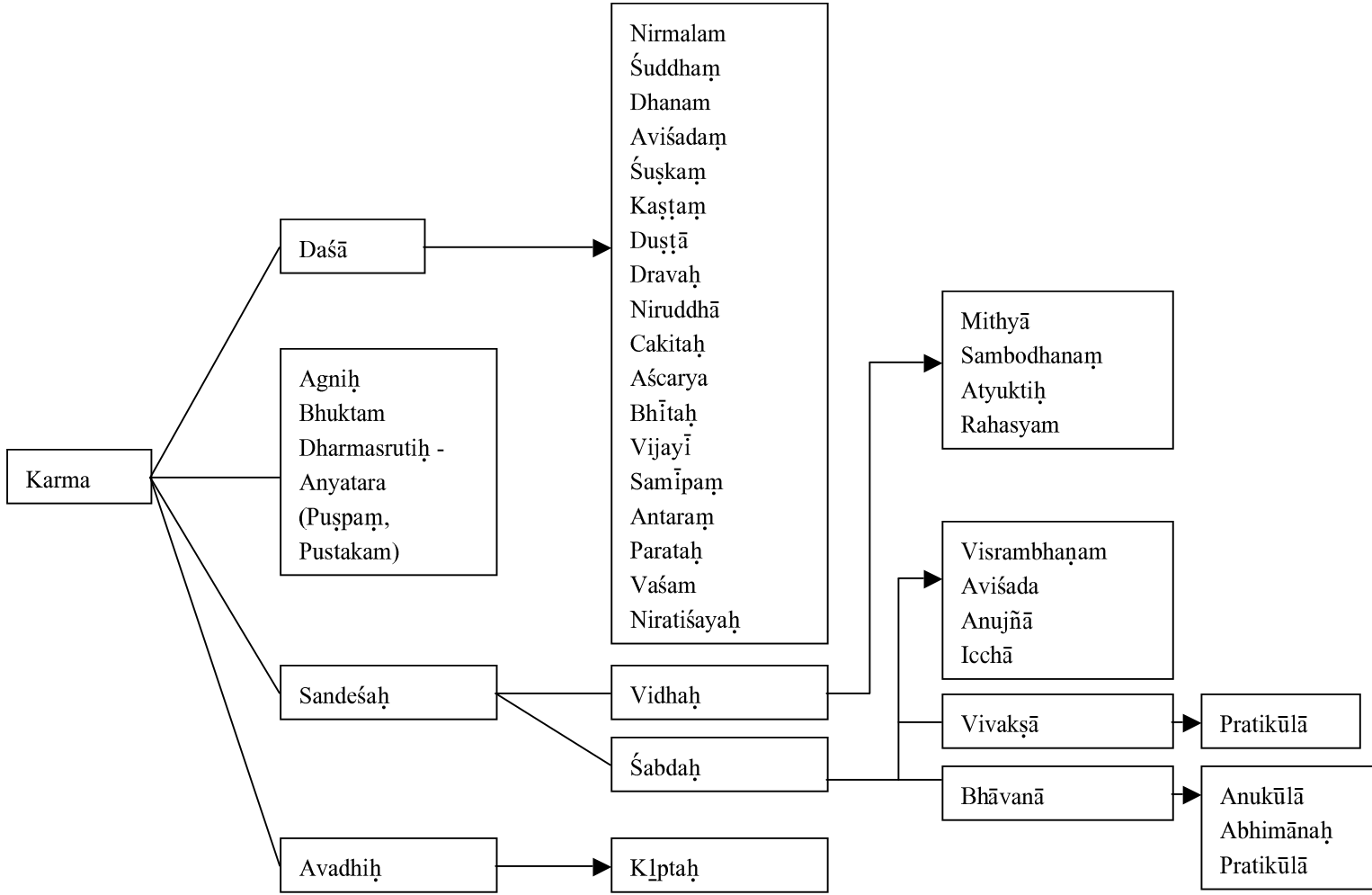


Figure 9.26



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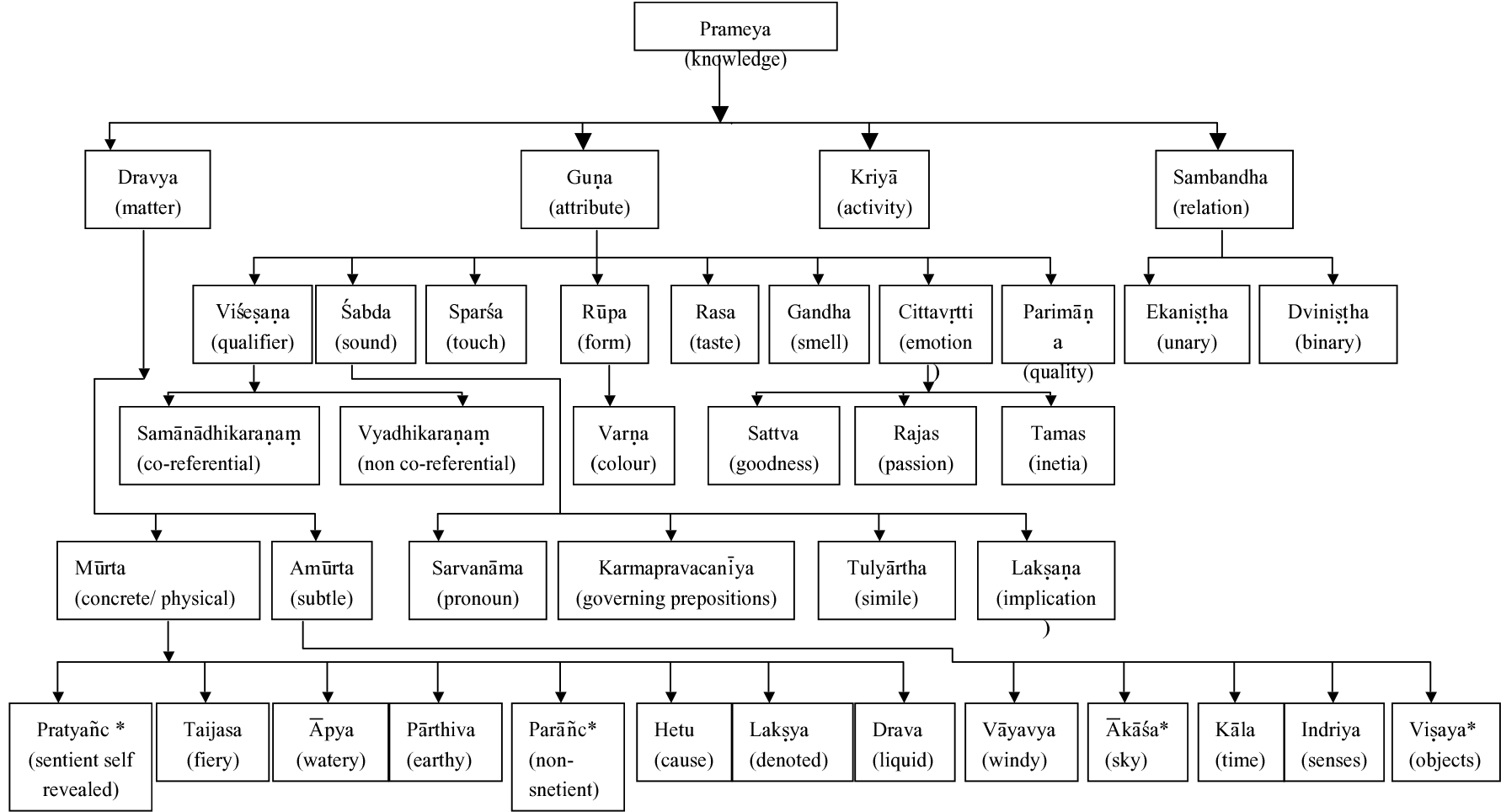
Figure 9.27



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Figure 9.28

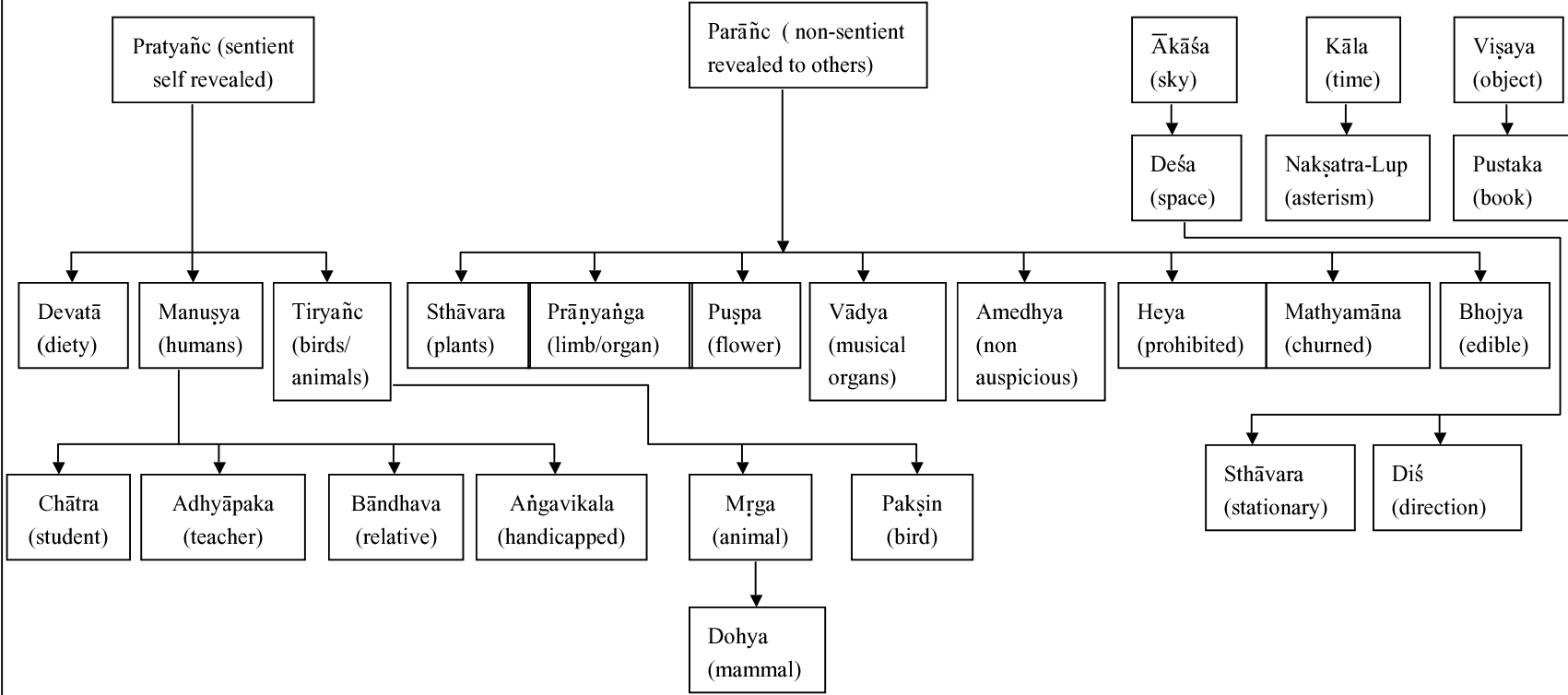
**Padārtha Vibhāgaḥ - An Ontology based on Grammar rules of
Kāraka and Vibhakti**



* marked items contd.... in next page

Figure 9.29

**Padārtha Vibhāgaḥ - An Ontology based on Grammer rules of
Kāraka and Vibhakti**



Contd.. From previous page

Figure 9.30

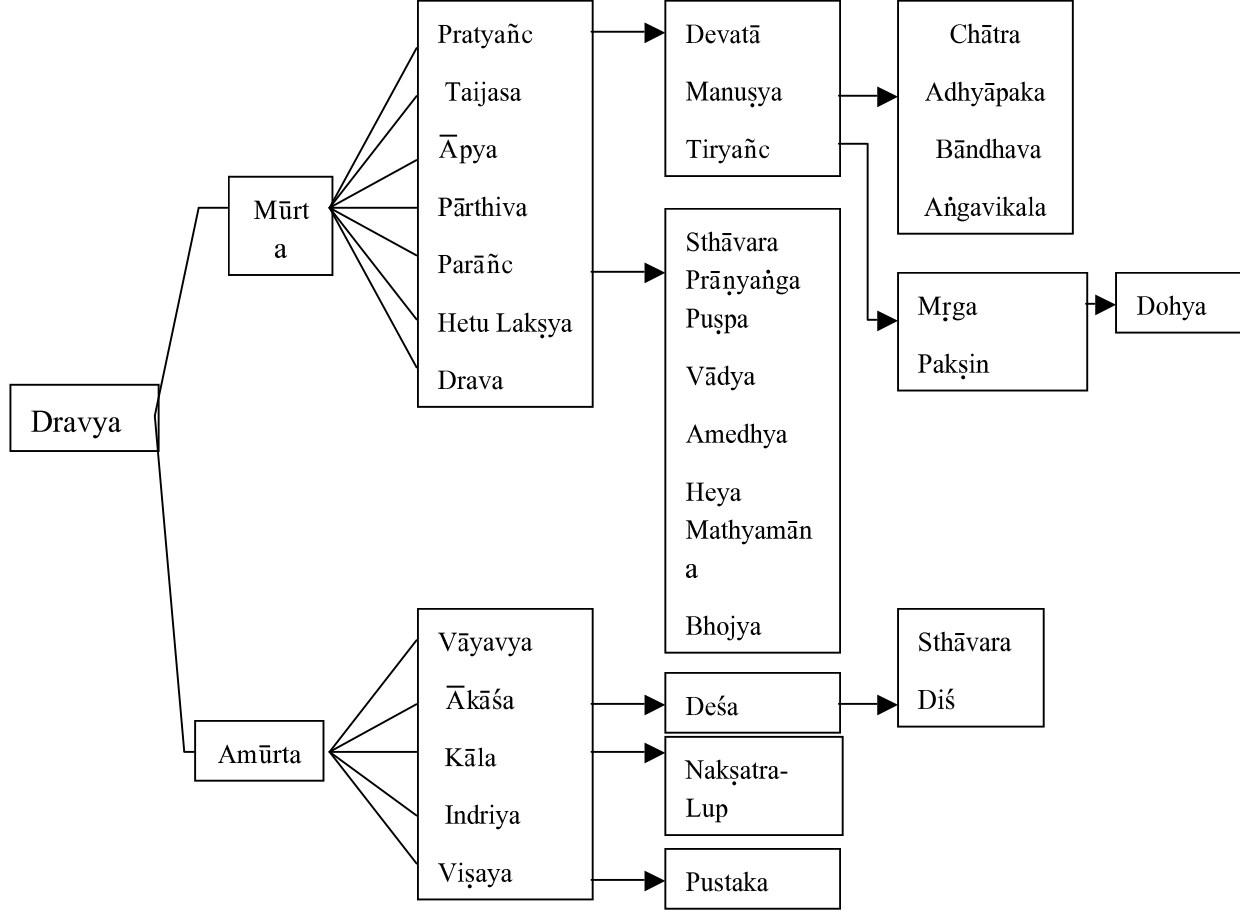


Figure 9.31

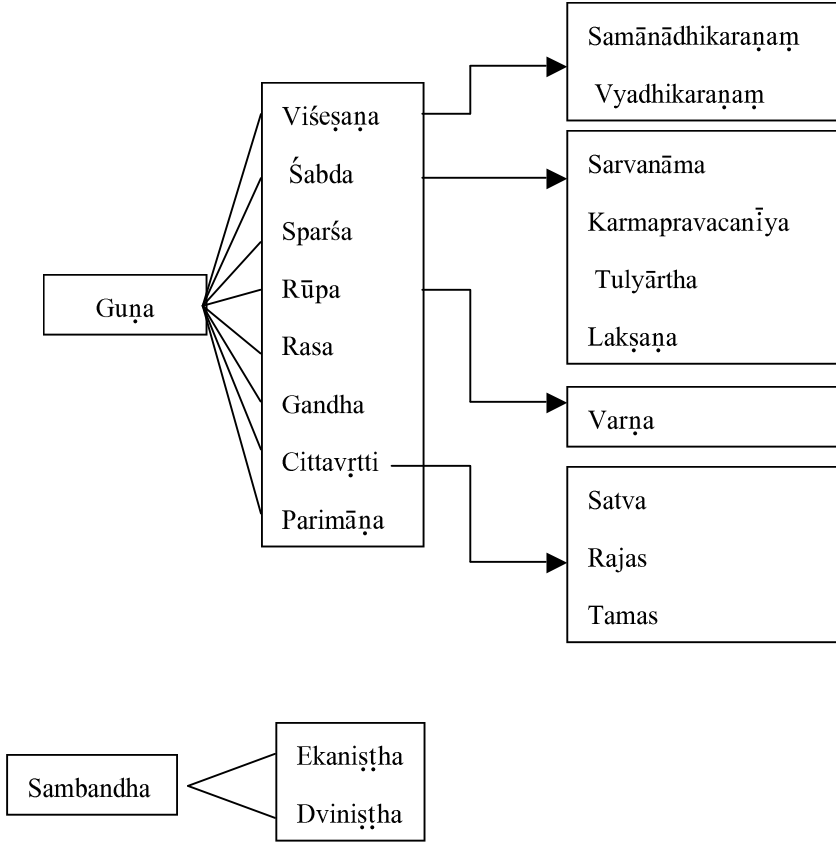


Figure 9.32

Śābda-bodha classification

Diagram -1

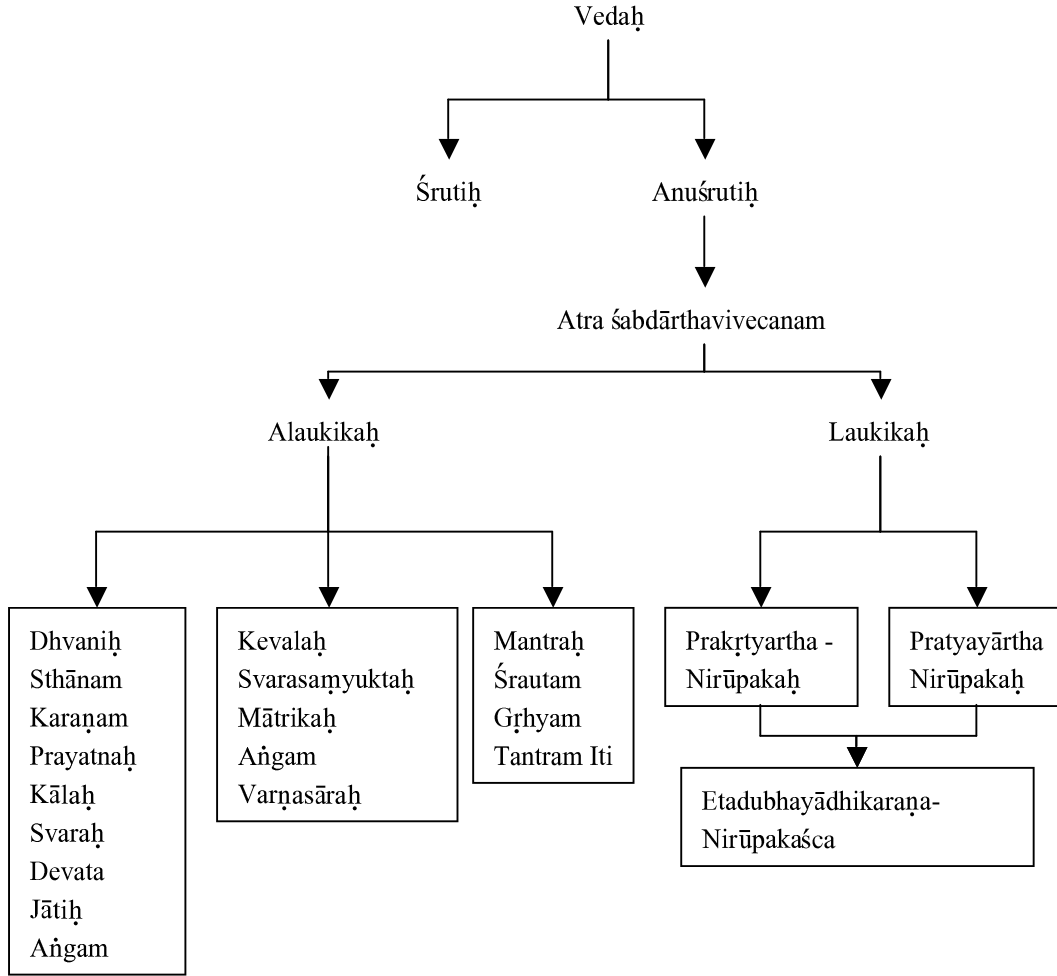


Diagram -2

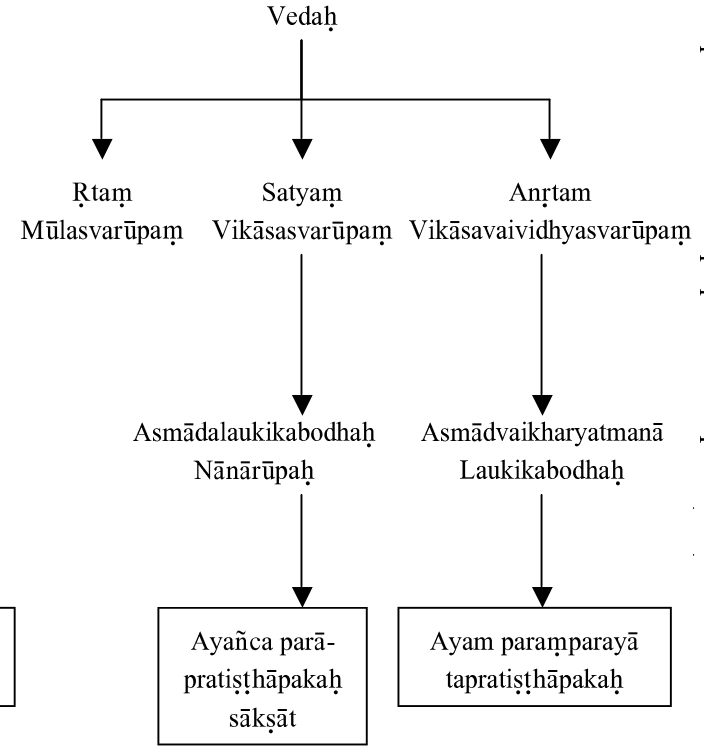


Figure 9.33

Vedic Śābda-bodha

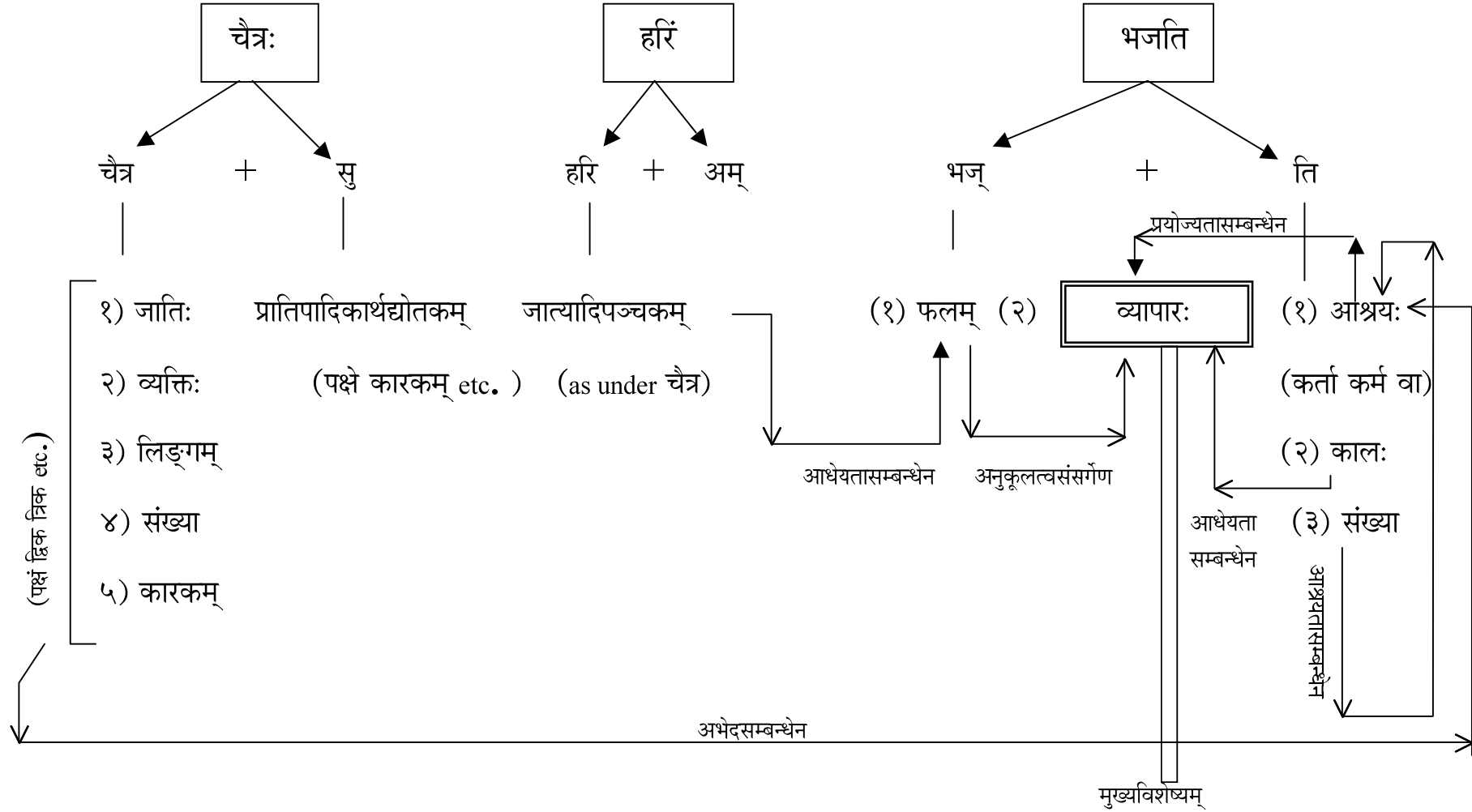
Input sentence : hariḥ om - All udātta at the commencement of Vedic recitation /chanting

Vedopakramanirūpaka-praṇavaḥ - Harirityatra Vartamānavisargo'rdhamātraḥ . Viramastvekamātrākālikaḥ . Dvayoḥ Padayoḥ
Sandhyabhāvarūpā Vivṛtiḥ Vatsānusṛtisañjñikā . Praṇavaścaturmātraḥ . Haripadamudāttam . Atra Svaraviśiṣṭo Varṇakramātmako Bodhaḥ -
Udāttadharmaviśiṣṭa Okāraḥ . Harirityatra Hakārodāttākāra-rephodāttekārodāttavisarjanīyāḥ Iti .

- h ——— Hakāra dhvani janita kaṇṭha sthāna tadadhobhāga karaṇābhyantara sañjñika vivṛtaprayatnabāhya sañjñika nādaghoṣa mahāprāṇa
prayatnārdhamātrākāla sūryadevatāka śūdrajātīya parasvarāṅga hakāra
- a ——— Nāda dhvani janita nātyupasaṃhṛtausthāna tādr̥ṣoṣṭhakaraṇābhyantarasañjñika saṃvṛtaprayatna bāhyasañjñika saṃvāra nādālpaprāṇa
prayatnaikamātrika vāyudevatāka brāhmaṇa jāti sātvikaguṇasahita tarjanyāṅguli madhyarekhāvinyāsa yogyādhyeṭṭdehadairghya dhvani
kāṭhinyakaṇṭhākāśakṛṣatvakara niṣādagāndhārasvaradvayahetubhūta mūrdhasthānodbhavadāttadharma viśiṣṭa vāyudevatāka
brāhmaṇajātīyākāra
- r ——— Nāda dhvanijanitadantamūloparibhāgasthānajiḥvāgramadhyakaraṇābhyantasañjñikeṣa tspr̥ṣṭaprayatnabāhyasañjñika saṃvāra nādāghoṣālpā
prāṇaprayatnāgnidevatākavaiśyajātiyāparasvarāṅga repha
- i ——— Nāda dhvatijanita tālusthāna jihvāmādhyaḥkaraṇavivṛtaprayatnaikamātrika vāyudevatāka brāhmaṇa jāti sātvikaguṇasahita
tarjanyāṅgulimadhyarekhāvinyāsayogyādhyeṭṭdehadairghya dhvanikāṭhinyakaṇṭhākāśakṛṣatvakara niṣādagāndhārasvaradvaya hetubhūta
mūrdhasthānodbhavadāttadharma viśiṣṭekāra
- ḥ ——— śvāsa dhvanijanita hanūmūlasthānajiḥvāmūlakaraṇavivṛtaprayatnārdhamātrākāla vāyudevatāka śūdra jātivisarjanīya
- o ——— Mātrikavatsānusṛti sañjñika vivṛttivirāma nāda dhvani janita hanūttaroṣṭobhayasthāna nātyupasaṃhṛtauṣṭhādharoṣṭho bhayakaraṇa
vivṛtaprayatna traimātrika bhūmidevatāka brāhmaṇajāti sātvikaguṇasahita tarjanyāṅgulimadhyarekhāvinyāsayogyādhyeṭṭdehadairghya dhvani
kāṭhinyakaṇṭhākāśakṛṣatvakara niṣādagāndhārasvaradvayahetubhūta mūrdhasthānodbhavadāttadharma viśiṣṭa okāra
- m ——— Nāda dhvani janitottaroṣṭhasthānādharoṣṭhakaraṇābhyantara sañjñika spr̥ṣṭaprayatna bāhyasañjñikasamvāraghoṣālpaprāṇa
prayatnaikamātrikārkadevatāka vaiśyajāti pūrvasvarāṅgamakārāḥ

Figure 9.34

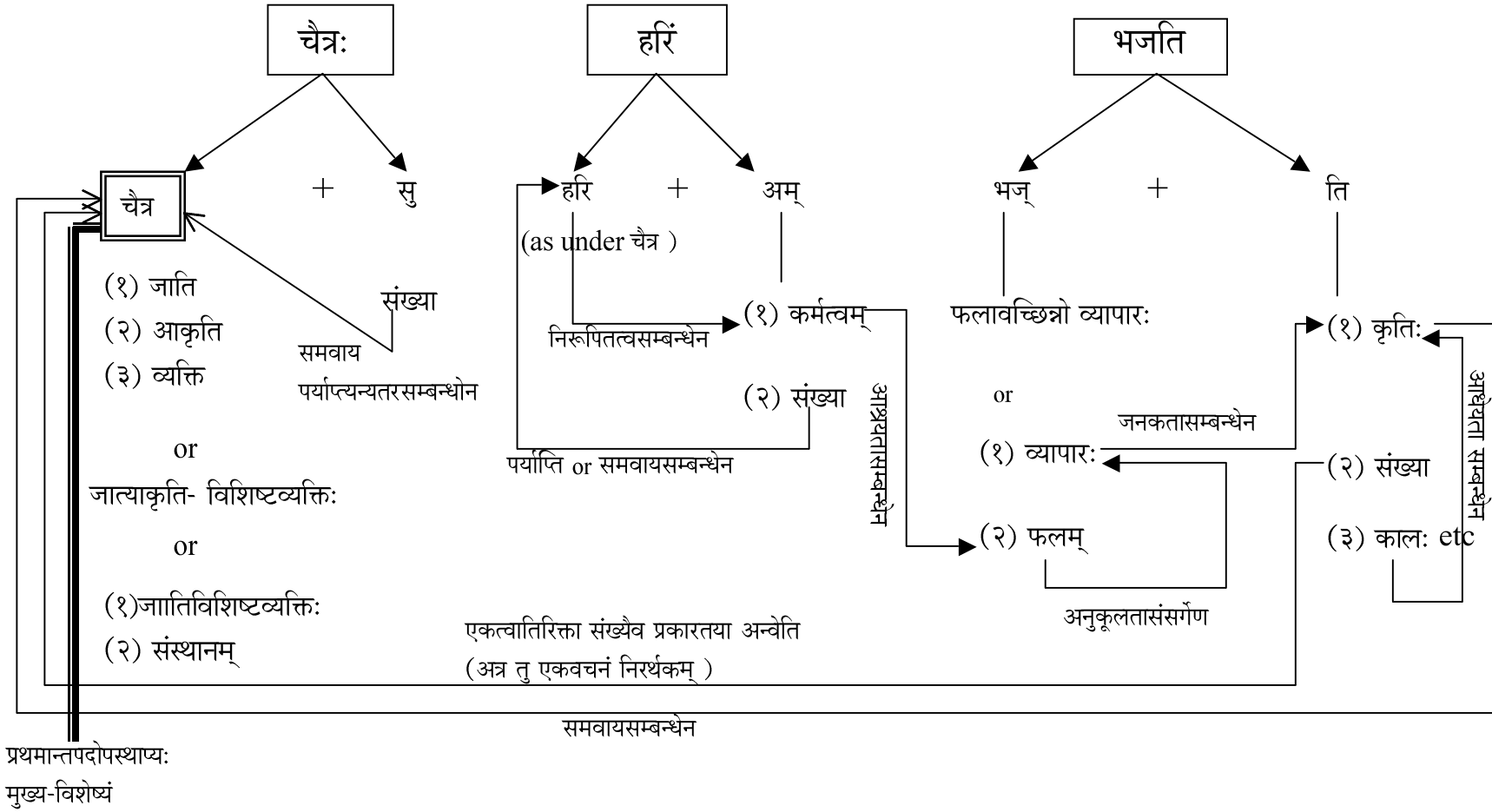
DIAGRAMMATIC REPRESENTATION OF THE THEORY OF ŚĀBDABODHA



I The Vaiyākaraṇa Theory of Śābdabodha (वैयाकरण शाब्दबोधः)

Figure 9.35

DIAGRAMMATIC REPRESENTATION OF THE THEORY OF ŚĀBDABODHA



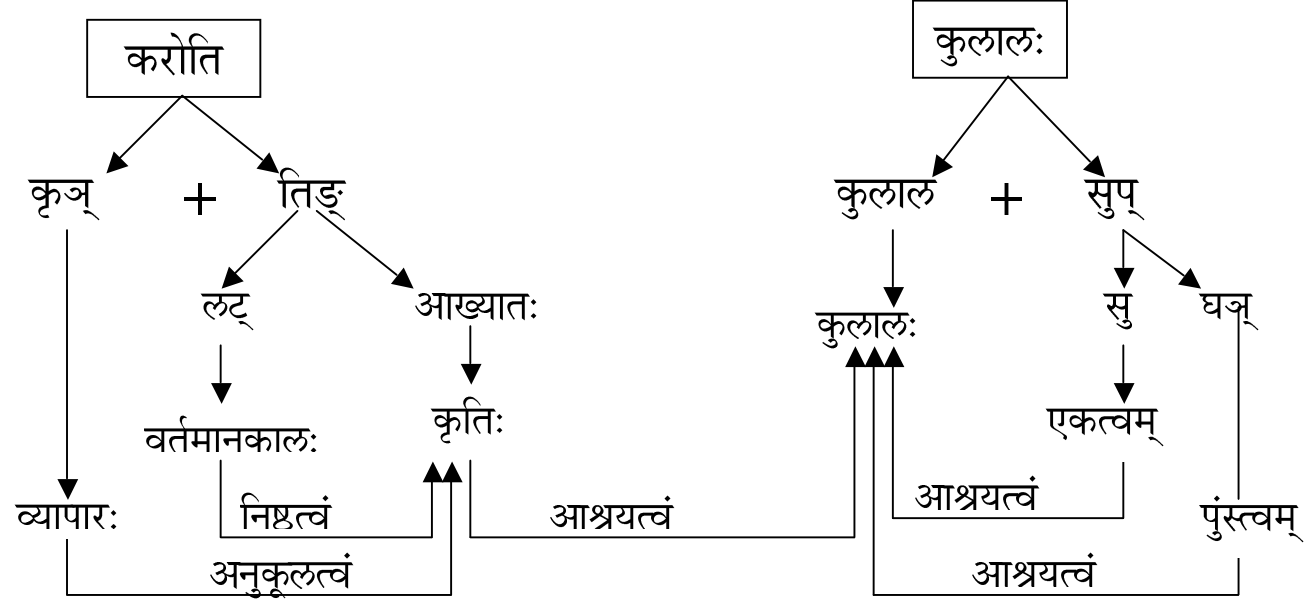
II The logical Theory of Śābdabodha (नैयायिक शाब्दबोधः)

Figure 9.36



नैयायिक शाब्दबोध प्रक्रिया

(The) Potter makes

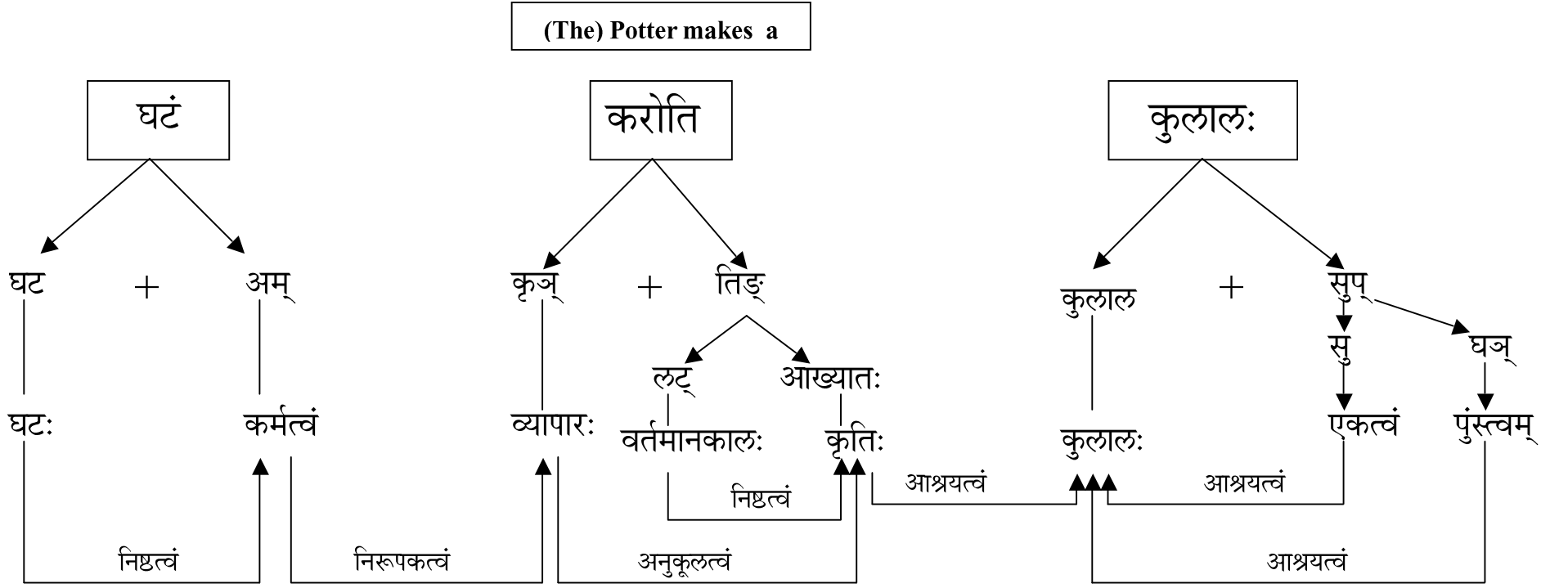


परिवृत्तिसहम् - प्रकृत्यर्थद्वयम् - 2 Variables; परिवृत्यसहम् - प्रत्ययार्थत्रयम्, सम्बन्धचतुष्टयम् - 3 + 4 Constants

सम्बन्धः - आश्रयता - सम्बन्धोऽयं सर्वत्र आख्यातार्थ-प्रकृत्यर्थयोः एव । अनुकूलता - सम्बन्धोऽयं सर्वत्र धात्वर्थाख्यातार्थयोः एव ।

शाब्दबोधः - व्यापारानुकूल वर्तमानकालवृत्ति कृत्याश्रयैकत्वाश्रय पुंस्त्वाश्रयः कुलालः ।

Naiyāyika-Śābda-bodhaḥ - Prathama-starah - Prathamānta-Subanta-kriyā-Pada-yutaḥ - Kartṛ-kāraḥ



परिवृत्तिसहम् - प्रकृत्यर्थत्रयम् 3 Variables ; परिवृत्यसहम् - प्रत्ययार्थपञ्चकम् + -सम्बन्धसप्तकम् 5+7 = 12 Constants

नियमाः -

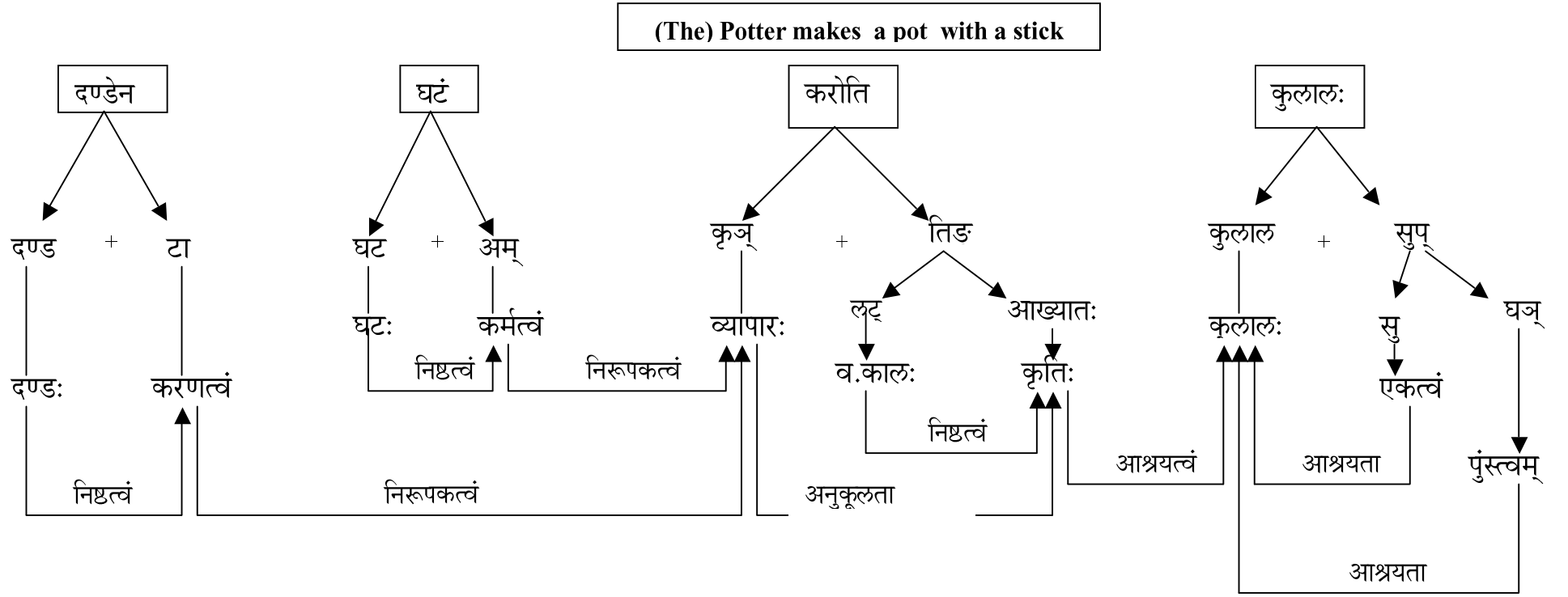
१. सुबर्थ-प्रकृत्यर्थयोः घञर्थ-प्रकृत्यर्थयोः सर्वत्र आश्रयत्वम् । एवं आख्यातार्थ-प्रकृत्यर्थयोः च ।

२. प्रकृत्यर्थ-प्रत्ययार्थयोः लङ्धाख्यातार्थयोः निष्ठत्वम् ।

३. प्रत्ययार्थ-धात्वर्थयोः सर्वत्र निरूपकत्वमर्थः । अपवादः - षष्ठीविभक्तिप्रत्ययार्थस्य तु सप्तम्याः प्रकृतौ अन्वयः ।

शाब्दबोधः - घटनिष्ठ-कर्मता-निरूपक-व्यापारानुकूल-वर्तमानकाल-वृत्ति-कृत्याश्रयैकत्वाश्रयपुंस्त्वाश्रयः कुलालः ।

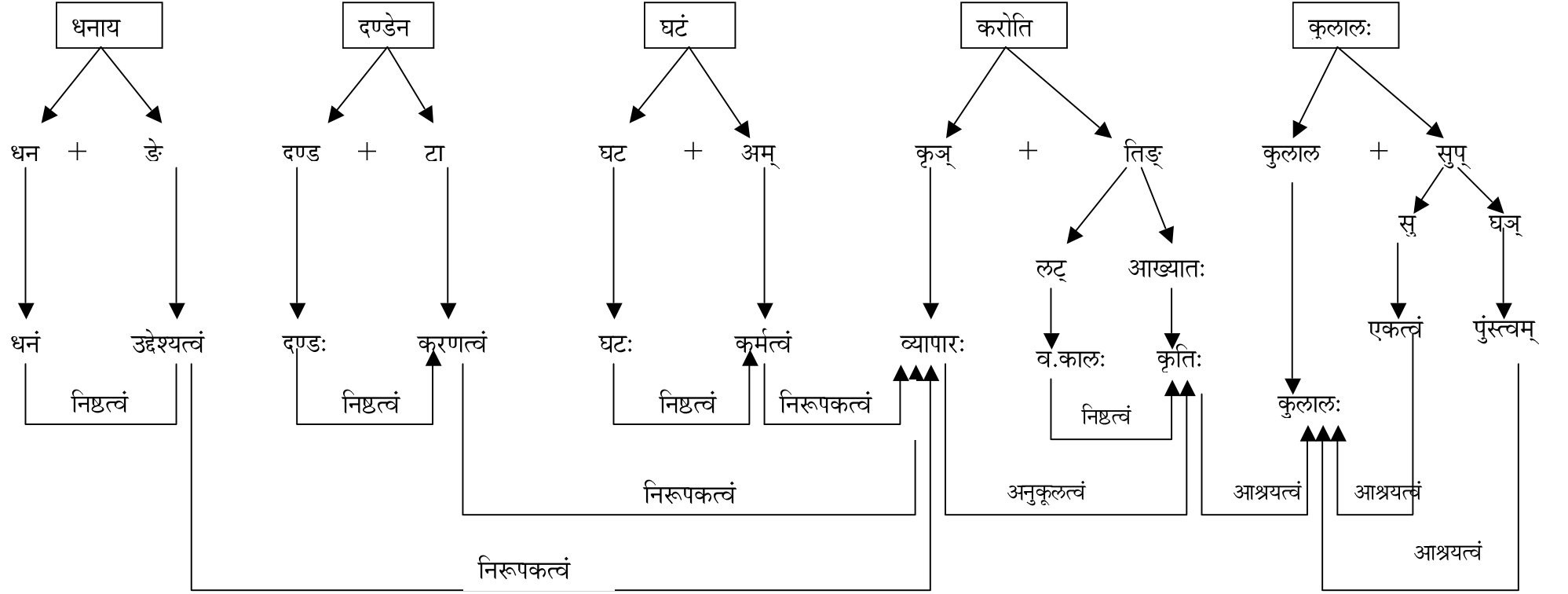
Naiyāyika-Śābda-bodhaḥ - Dvitiya-staraḥ - Karṭṛ-karma-kriyā-Pada-yutaḥ - Karma-kāraḥ



शाब्दबोधः - दण्डनिष्ठ-करणतानिरूपक-घटनिष्ठ-कर्मता-निरूपक-व्यापारानुकूल-वर्तमानकाल-वृत्ति-कृत्याश्रयैकत्वाश्रयपुंस्त्वाश्रयः कुलालः ।

Naiyāyika-Śābda-bodhaḥ - Tṛtīya-staraḥ - Karṭṛ-karma-Karaṇa-kriyā-Pada-yutaḥ - Karaṇa-kāraṇam

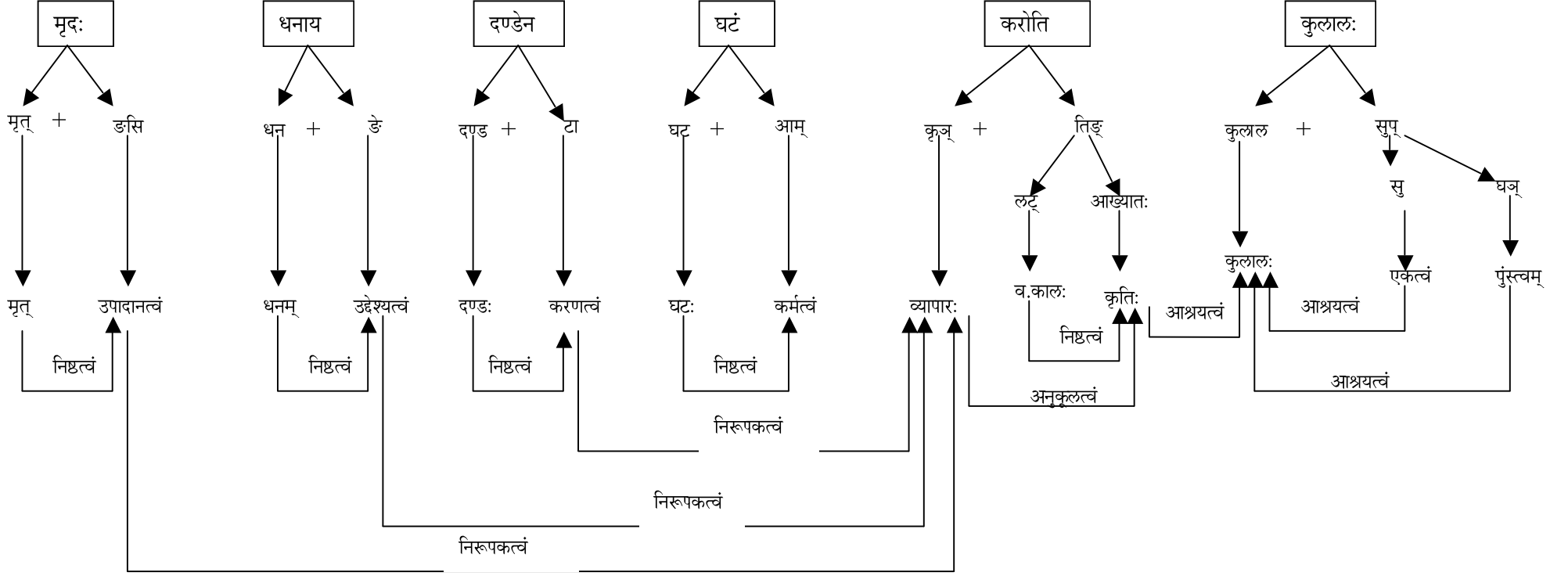
(The) Potter makes a pot with a stick for money



शाब्दबोधः - धननिष्ठोद्देश्यतानिरूपक-दण्डनिष्ठकरणतानिरूपक-घटनिष्ठकर्मतानिरूपक-व्यापारानुकूल-वर्तमानकालनिष्ठ-कृत्याश्रयैकत्वाश्रयपुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Caturtha-staraḥ - Karṭṛ-karma-Karaṇa-sampradāna-kriyā-Pada-yutaḥ - Sampradāna-kāraṇam

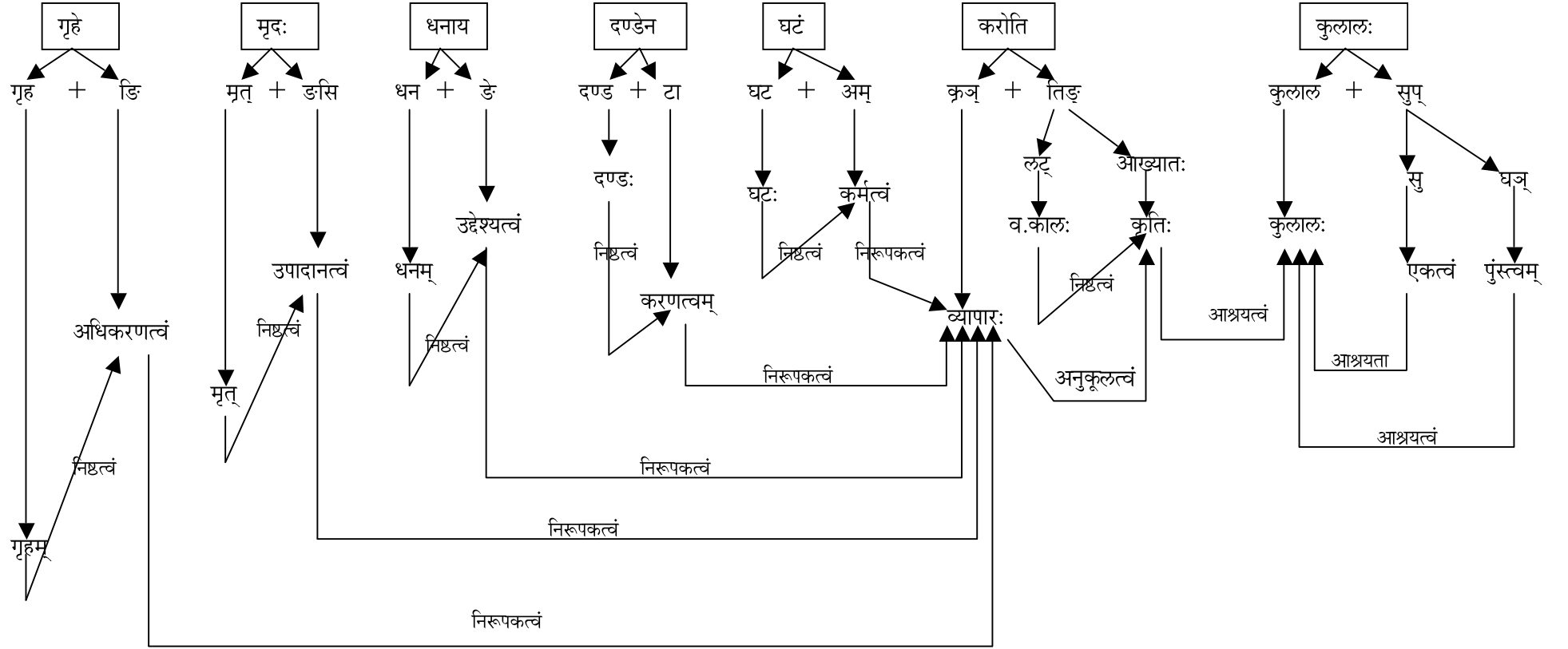
(The) Potter makes a pot from mud with a stick for



शाब्दबोधः :- मृत्निष्ठोपादानतानिरूपक-धननिष्ठोद्देश्यतानिरूपक-दण्डनिष्ठकरणतानिरूपक-घटनिष्ठकर्मतानिरूपक-व्यापारानुकूल-वर्तमानकालवृत्ति-कृत्याश्रयैकत्वाश्रयःपुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Pañcama-staraḥ - Karṭṛ-karma-Karaṇa-sampradāna-Apādāna-kriyā-Pada-yutaḥ - Apādāna-kāraṇam

(The) Potter makes a pot at home from mud with a stick for

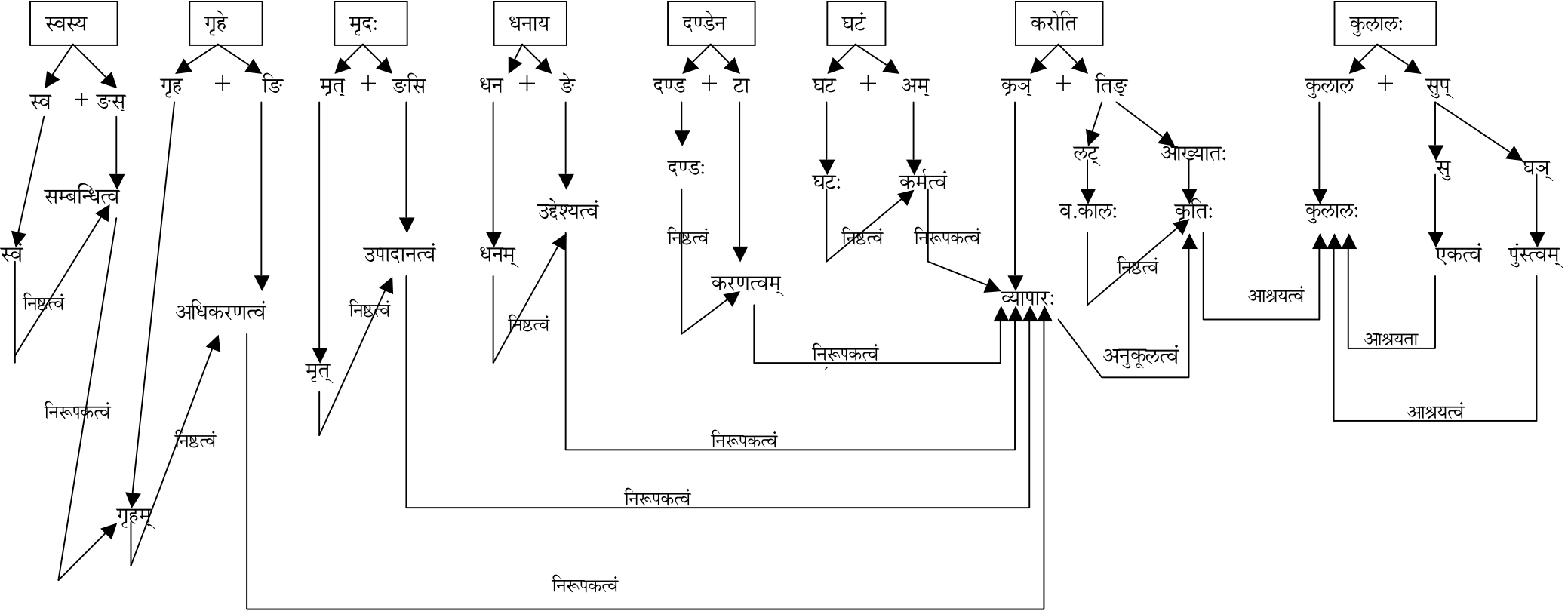


शाब्दबोधः - गृहनिष्ठाधिकरणतानिरूपक-मृत्रिष्ठोपादानतानिरूपक-धननिष्ठोद्देश्यतानिरूपक-दण्डनिष्ठकरणतानिरूपक-
घटनिष्ठकर्मतानिरूपक-व्यापारानुकूल-वर्तमानकालवृत्ति-कृत्याश्रयैकत्वाश्रयः पुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Ṣaṣṭha-staraḥ - Karṭṛ-karma-Karaṇa-sampradāna-Apādāna-Adhikaraṇa-kriyā-Pada-yutaḥ - Adhikaraṇa-kāraṇam

Figure 9.43

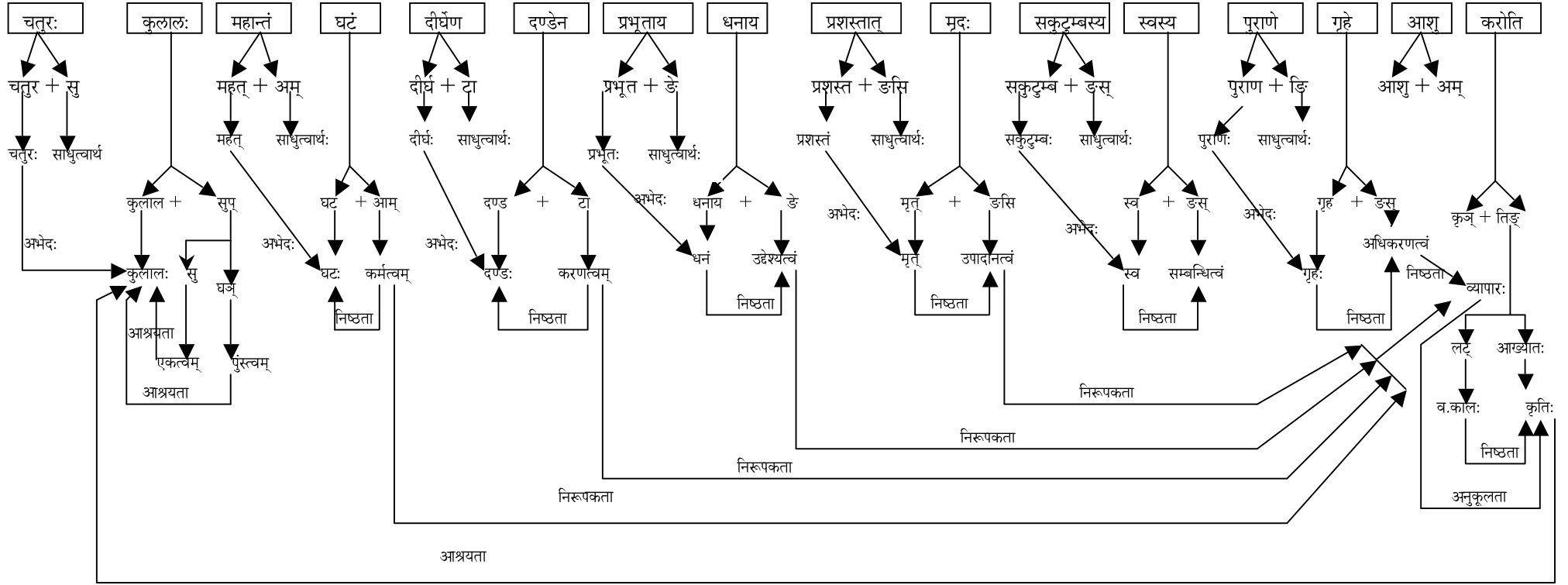
(The) Potter makes a pot in his home from mud with a stick for



शाब्दबोधः - -स्वनिष्ठसम्बन्धितानिरूपक-गृहनिष्ठाधिकरणतानिरूपक-मृन्निष्ठोपादानतानिरूपक-धननिष्ठोद्देश्यतानिरूपक-दण्डनिष्ठकरणतानिरूपक-घटनिष्ठकर्मतानिरूपक-व्यापारानुकूल-वर्तमानकालवृत्ति-कृत्याश्रयैकत्वाश्रय-पुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ-Saptama-starah-Kartṛ-karma-Karaṇa-sampradāna-Apādāna-Adhikaraṇa-Sambandha-kriyā-Pada-yutaḥ-Sambandhaḥ

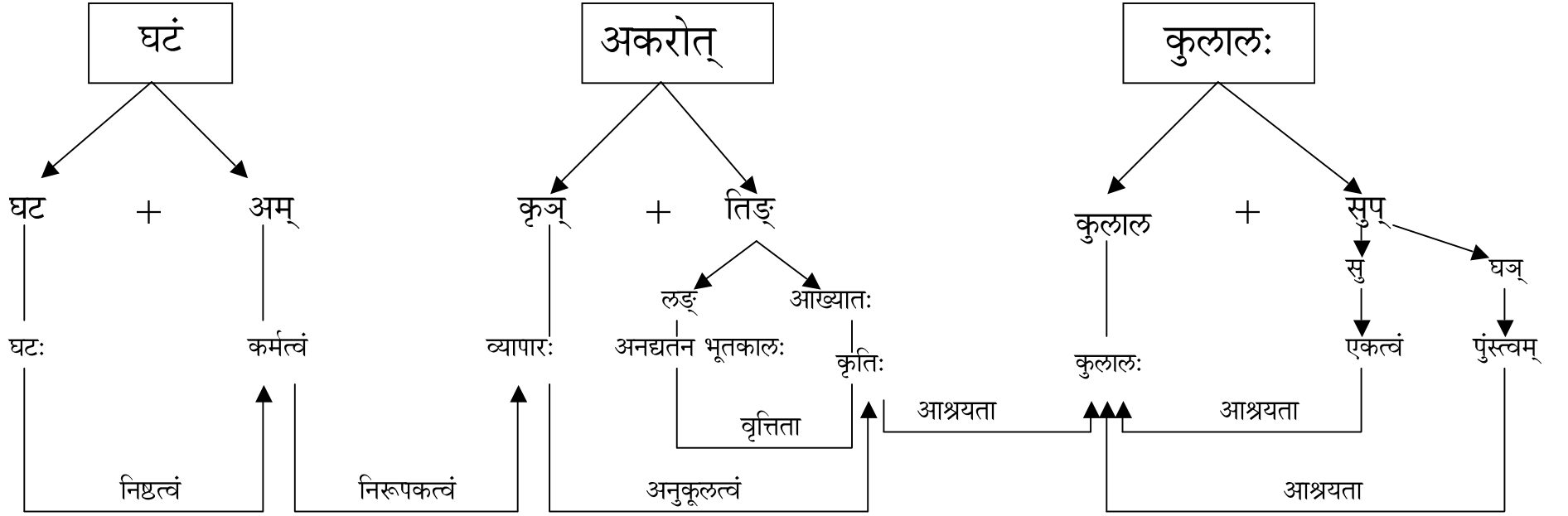
(The) Smart Potter quickly makes a big pot from fertile mud with a long stick for lot of money at his familial old house



शाब्दबोधः - महदभिन्न-घटनिष्ठकर्मतानिरूपक-दीर्घाभिन्नदण्डनिष्ठकरणतानिरूपक-प्रभूताभिन्नधननिष्ठोद्देश्यतानिरूपक-प्रशस्ताभिन्न-मृत्रिष्ठोपादानतानिरूपक-सकुटुम्बाभिन्न-स्वनिष्ठसम्बन्धितानिरूपक-पुराणाभिन्नगृहनिष्ठाधिकरणतानिरूपक-आश्वभिन्न-व्यापारानुकूल-वर्तमानकालनिष्ठ-कृत्याश्रयः एकत्वाश्रयः पुंस्त्वाश्रयः चतुराभिन्न-कुलालः ।

Naiyāyika-Śābda-bodhaḥ - Aṣṭama-staraḥ - Saviśeṣaṇa-Sarvakāraka-Sasambandha-kriyā-Pada-yutaḥ - Viśiṣṭa-Bodhaḥ

(The) Potter made a pot (imperfect tense)

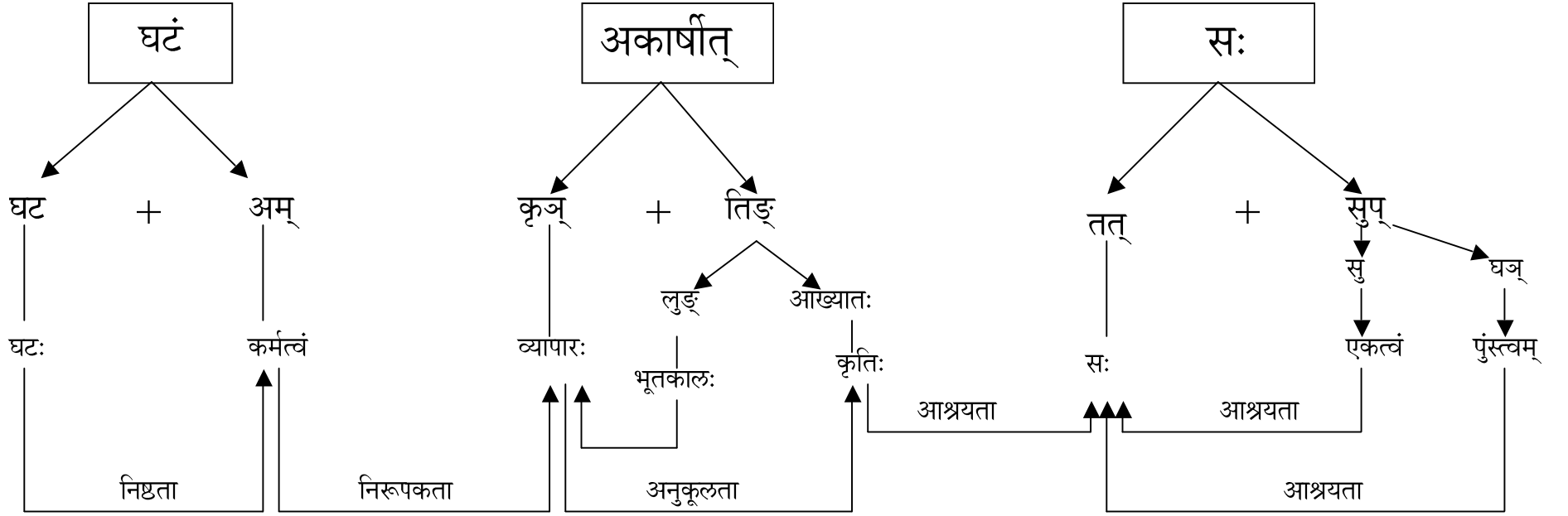


शाब्दबोधः - घटनिष्ठ-कर्मता-निरूपक-अनद्यतन-भूतकाल-वृत्ति-कृत्याश्रयैकत्वाश्रय-पुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Dvitiya-starah - Kartṛ-Karma-kriyā-Pada-yutaḥ - Karma-kāraṇam (Bhūta-kālikah)

Figure 9.46

He made a pot (Aorist tense)

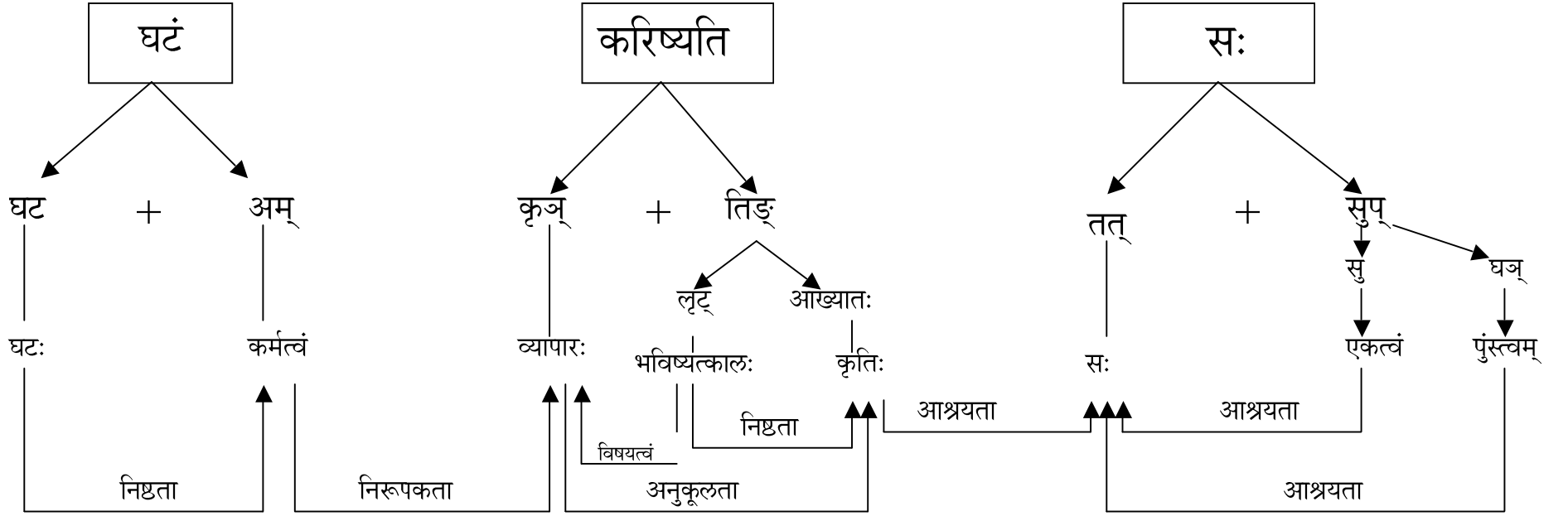


शाब्दबोधः - घटनिष्ठकर्मतानिरूपक-व्यापारानूकूल-भूतकालवृत्ति-कृत्याश्रयः एकत्वाश्रयः पुंस्त्वाश्रयः सः (कुलालः) ।

Naiyāyika-Śābda-bodhaḥ - Dvitiya-staraḥ - Karṭṛ-Karma-kriyā-Pada-yutaḥ - Karma-kāraṇam (Anadyatana-Bhūta-kālikah)

Figure 9.47

He will make a pot (Future tense)

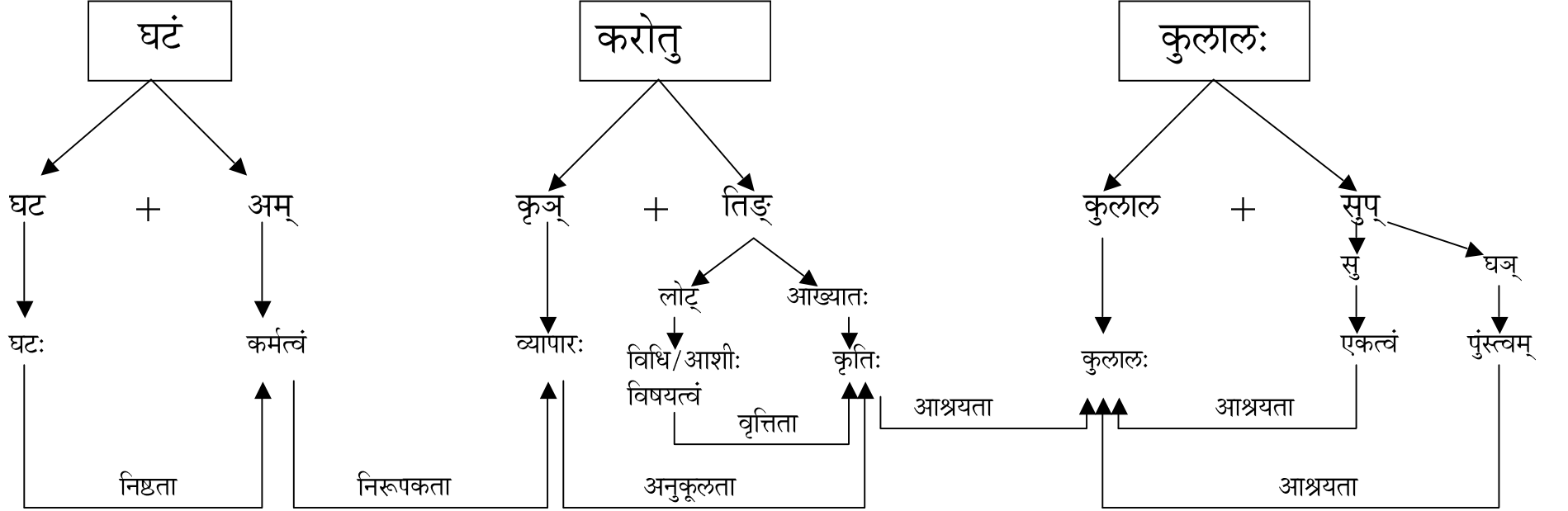


शाब्दबोधः - घट-निष्ठकर्मतानिरूपक-व्यापारानूकूल-भविष्यकाल-विषयः व्यापारः तदनुकूल-कृत्याश्रयः एकत्वाश्रयः पुंस्त्वाश्रयः सः (कुलालः) ।

Naiyāyika-Śābda-bodhaḥ - Dvitiya-starah - Karṭṛ-Karma-kriyā-Pada-yutaḥ - Karma-kāraḥ (Bhaviṣyat-kālikah)

Figure 9.48

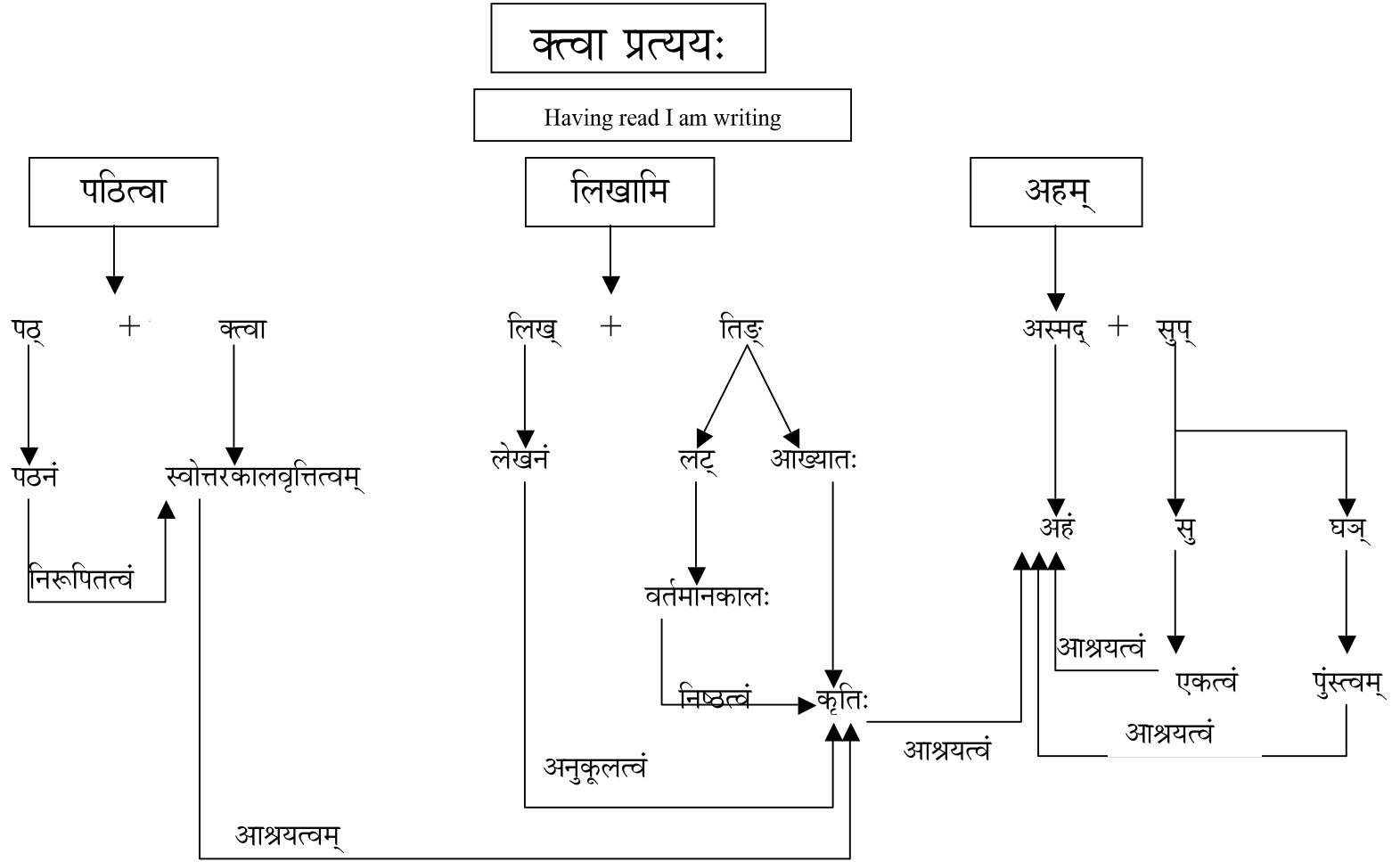
Let The Potter make a pot (optative/potential mode)



शाब्दबोधः - घटनिष्ठ-कर्मता-निरूपक-व्यापारानुकूल-विध्याशीरन्यतर-विषय-वृत्ति-कृत्याश्रयैकत्वाश्रय-पुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Dvitiya-staraḥ - Karṭṛ-Karma-kriyā-Pada-yutaḥ - Karma-kāraṇam (Vidhi/Āśīḥ Anyatarārthakaḥ)

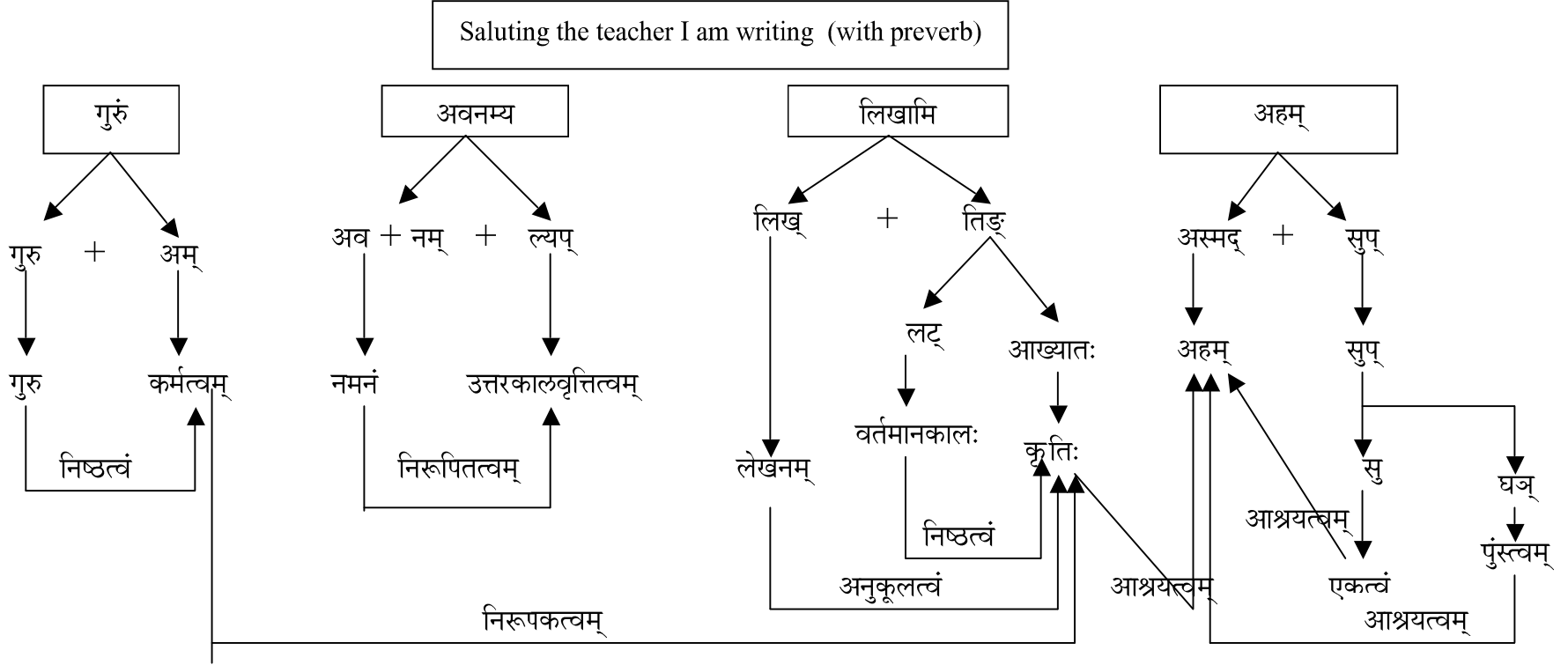
Figure 9.49



शाब्दबोधः - पठननिरूपितस्वोत्तरकालवृत्तित्वाश्रयः लेखनानुकूलवर्तमानकाल निष्ठकृत्याश्रयः एकत्वाश्रयः पुंस्त्वाश्रयः अहम् । or
पठननिरूपितस्वोत्तरकालवृत्तित्ववल्लेखनानुकूलवर्तमानकालनिष्ठकृत्याश्रयैकत्वाश्रयपुंस्त्ववानहम्

Naiyāyika-Śābda-bodhaḥ - Prathama-staraḥ - Karṭṛ-kriyā-Pada-yutaḥ - Kramika-kriyā-dvayam (Pūrvakāla-kriyārthakaḥ)

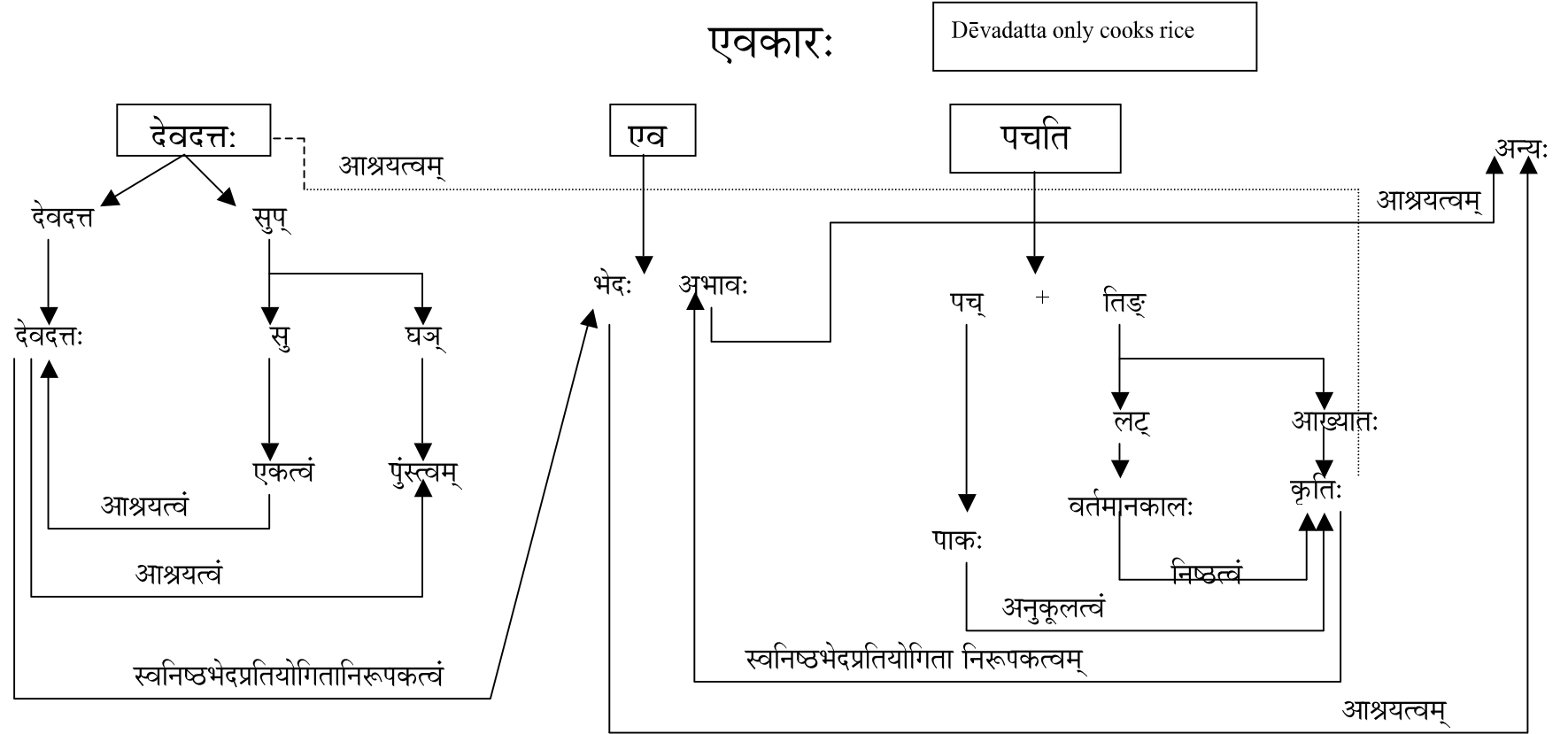
(ल्यप्) क्त्वा प्रत्ययः



शाब्दबोधः - गुरुनिष्ठकर्मतानिरूपक नमननिरूपितोत्तरकालवृत्तित्वाश्रयलेखनानुकूलवर्तमानकालवृत्तिकृत्याश्रयैक्त्वाश्रयः पुंस्त्वाश्रयः (उदाहरणार्थम् - एष शब्दः लिङ्गत्रयेऽपि समानः) अहम्

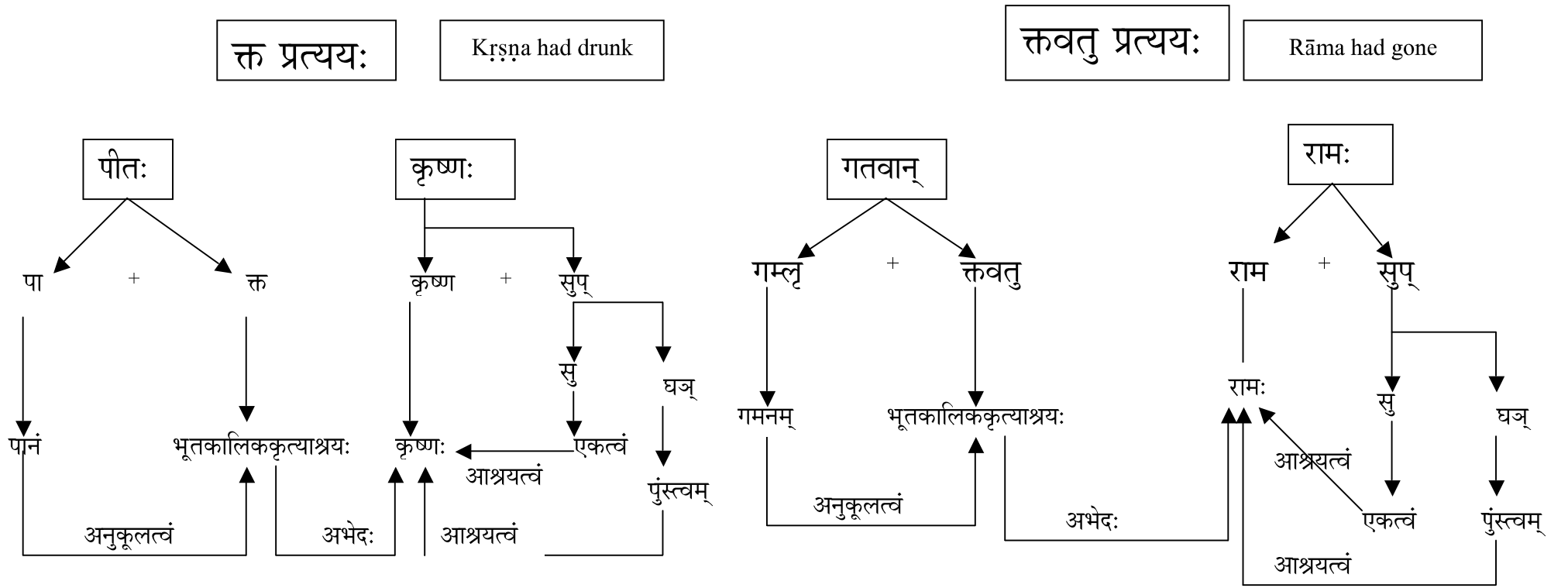
नियमाः - १. केवलधात्वर्थस्य अवाद्युपसर्गपूर्वक-धात्वर्थस्य च क्रमेण क्त्वा-ल्यबर्थयोः सार्धं (सर्वत्र) निरूपितत्वं सम्बन्धः । २. क्त्वा-ल्यपोः सर्वत्र (स्व) उत्तरकालवृत्तित्वम् अर्थः । ३. वाक्येषु सर्वत्र प्रथमान्तपदाभावे सति तदनुरोधेन अध्याहार्यम् । ४. क्त्वा-ल्यबर्थस्य उत्तरकालवृत्तित्वस्य आख्यातार्थकृतौ आश्रयत्वं सम्बन्धः ।

Naiyāyika-Śābda-bodhaḥ - Prathama-starah- Karṭṛ-Upasrṣṭa-dhātu-yutaḥ - Kramika-kriyā-dvayam (Pūrvakāla-kriyārthakaḥ)



- शाब्दबोधः** - पाकानुकूल-कृत्याश्रयः एकत्वाश्रयः पुंस्त्वाश्रयः देवदत्तः OR देवदत्तनिष्ठ-प्रतियोगितानिरूपक-भेदाश्रयः पाकानुकूलकृतिनिष्ठ-प्रतियोगितानिरूपकाभावाश्रयः अन्यः (अपेक्षाबुद्ध्या ग्राह्यः) ।
- नियमाः** - १. एवकारस्य सर्वत्र भेदः, अभावः इति अर्थद्वयम् । २. एवकारघटिते च वाक्ये शाब्दबोधावसरे वाक्यद्वयं प्रतिभासते । प्रकृतवाक्यस्य प्रथमान्तविशेष्यकः एकः, अन्यपदार्थविषयकः अपरः । ३. प्रकृतवाक्यघटकप्रथमान्तपदस्य एवकारार्थैकदेशभेदेन सार्धं स्वनिष्ठभेदप्रतियोगिताकत्वं सम्बन्धः । ४. एवकारार्थयोः भेदाभावयोः आश्रयतासम्बन्धेनैव अन्यपदार्थे अन्वयः । (भेदाभावयोः अन्यपदार्थस्य च आश्रयत्वं सम्बन्धः)

Naiyāyika-Śābda-bodhaḥ - Prathama-starah - Karṭṛ-Kriyāpada-yutaḥ - Avadhāraṇārthakaḥ)



शब्दबोधः पानानुकूल भूतकालिक कृतिमदभिन्नैकत्वाश्रयपुंस्त्वाश्रयः कृष्णः

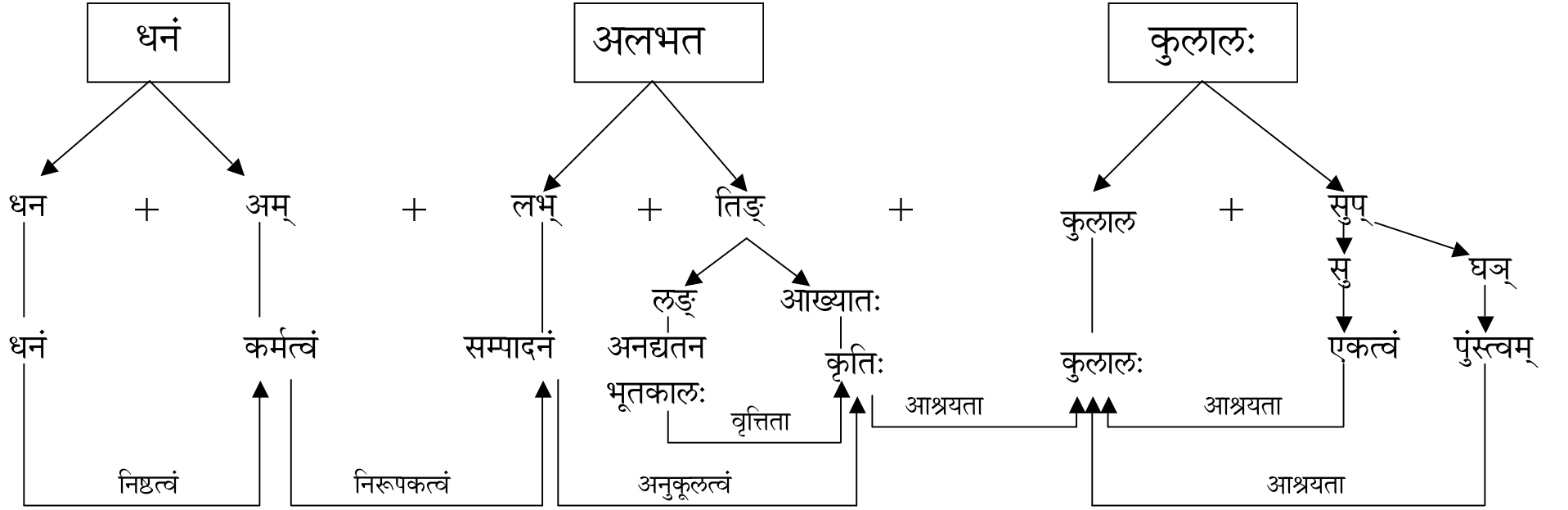
शब्दबोधः - गमनानुकूलभूतकालिककृत्याश्रयाभिन्नैकत्वाश्रयः पुंस्त्वाश्रयः रामः

नियमः - १. क्तक्तवत्वोः सर्वत्र भूतकालिककृत्याश्रयः अर्थः । २. क्तक्तवत्वर्थयोः प्रथमान्तार्थेन सार्धं अभेदः सम्बन्धः (अभेदान्वयं प्रति समानविभक्तिकत्वस्य तन्त्रत्वात्)

Naiyāyika-Śābda-bodhaḥ - Prathama-antaraḥ- Karṭṛ-Kṛdanta-yutaḥ - Bhūtakālikārthakaḥ)

Figure 9.53

(The) Potter got money (imperfect tense)



शाब्दबोधः - धननिष्ठ-कर्मता-निरूपक-सम्पादनानुकूल-अनद्यतन-भूतकाल-वृत्ति-कृत्याश्रयैकत्वाश्रय-पुंस्त्वाश्रयः कुलालः

Naiyāyika-Śābda-bodhaḥ - Dvitiya-starah - Kartṛ-Karma-kriyā-Pada-yutaḥ - Karma-kāraḥ (Bhūta-kālikah)