A Syntax Directed Environment for Tabular Form Designing

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1. INTRODUCTION

Aims of Our Environment

- To **Guide Syntactically Valid Items** by Productions
- To **Evaluate the Impact Area of Rewriting** by Productions
- **Automatic Drawing** by Attribute Rules

Background and Position

Present : Manual Designing

Our Goal : Syntactic Designing
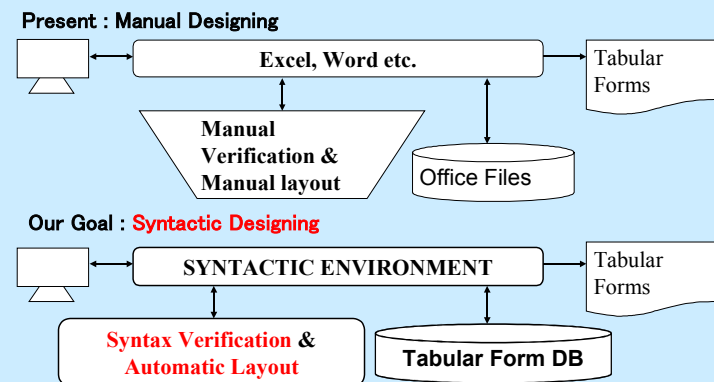
Target Tabular Forms

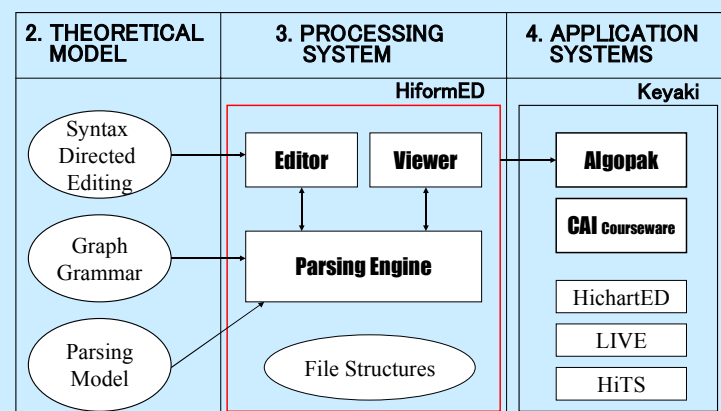**Hiform : Modular Program Specification Forms**

- Hiform includes all items in ISO6592
- Hiform : sequence of 17 types of forms

Program Specification Form

Contents

2. THEORETICAL MODELS

The Modeling of Tabular Forms by Marked Graphs

Tabular Form F_1

Nested Diagram

Marked Graph G_1
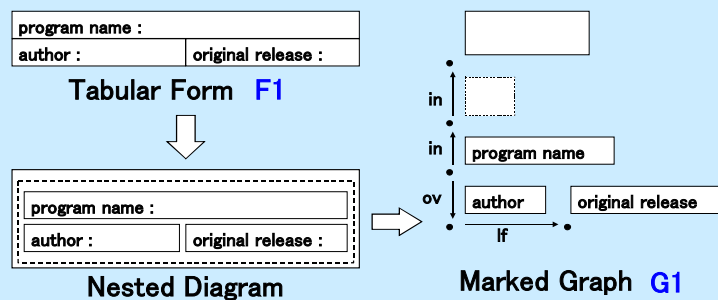
The Modeling of Hiform by An Attribute edNCE Graph Grammar

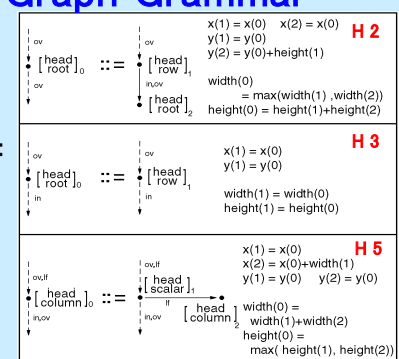$HNGG = <G_N, A_N, F_N>$
formulates Hiform

$G_N = (\Sigma_N, \Delta_N, \Gamma_N, \Omega_N, P_N, S_N)$:
Underlying Graph Grammar
(edNCE context-free graph grammar)
P_N : **280** Productions
A_N : The **Attributes**
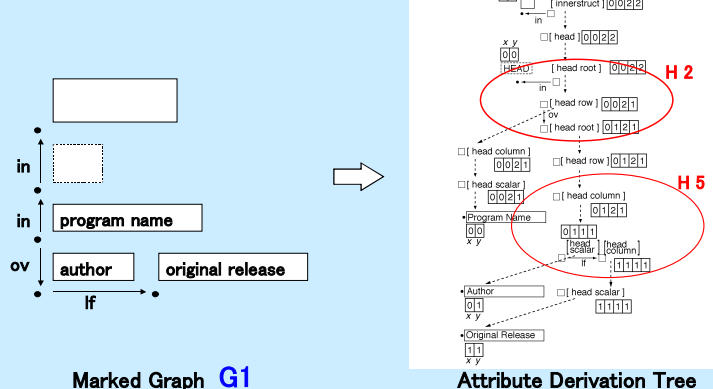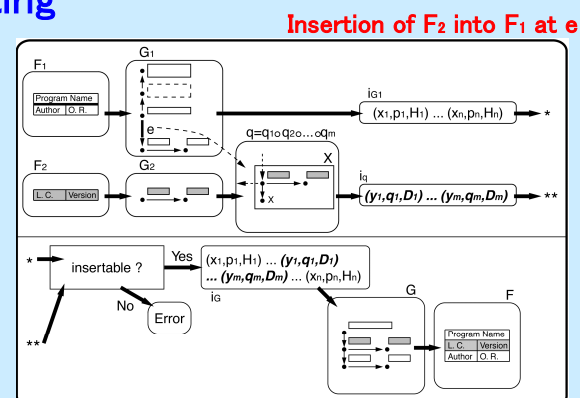F_N : **1248** Attribute Rules

A part of productions in HNGG
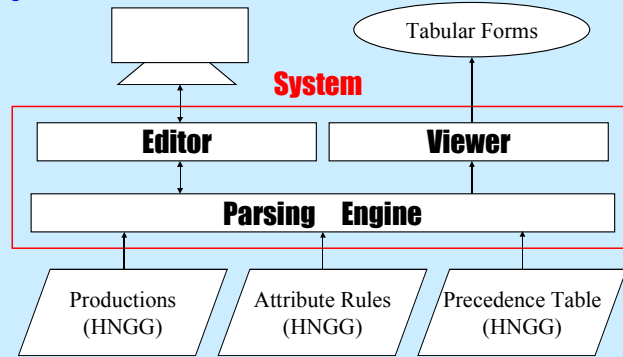
The Modeling of Parsing : A Derivation Tree

Marked Graph G_1

Attribute Derivation Tree

The Modeling of Syntax Directed Editing

Insertion of F_2 into F_1 at e

3. PROCESSING SYSTEM (CONCEPTS)

System Structure

System

Tabular Forms

Editor | Viewer

Parsing Engine

Productions (HNGG) | Attribute Rules (HNGG) | Precedence Table (HNGG)

File Structures

Browser (IE etc.)

GML* File | XML File | XML Style File

System

File Manager / Editor | Viewer

Marked Graph Code* | Derivation Tree Code*

Parsing Engine

* We introduce here
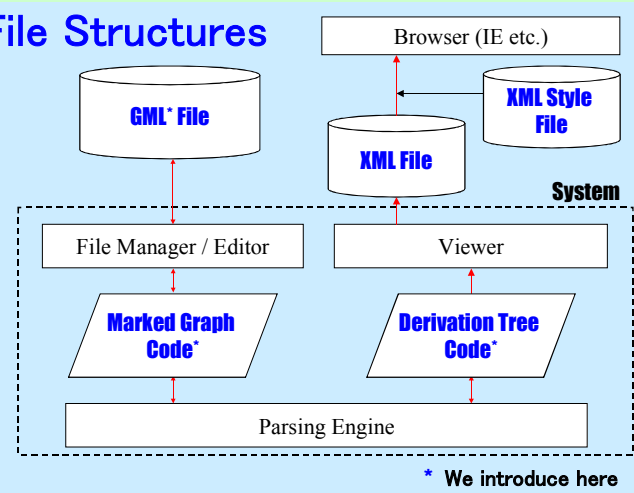
An Execution Screen of Parsing Engine

Input : Marked Graph

Output : Derivation Tree
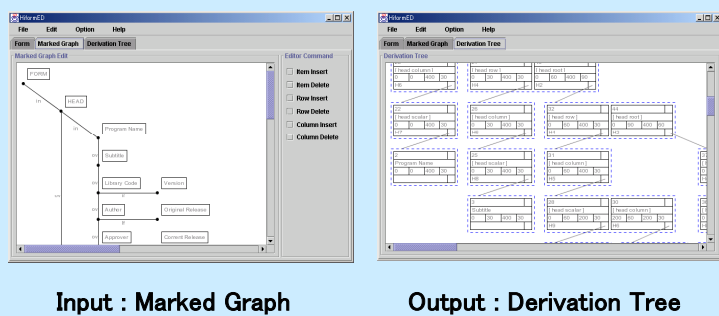
System Features

Editor	Under development
Viewer	Under development
Parsing Engine	5k Java lines
Productions	280 Productions
Attribute Rules	1248 Rules
Precedence Table	5376 Relations
Marked Graph Code	Inner Code of Marked Graph
GML: Graph Modeling Language	File Format of Marked Graph
Derivation Tree Code	Inner Code of Derivation Tree

4. APPLICATION SYSTEMS

Algopak — Hiform Documents for 64 Fundamental Algorithms (452 forms); Text Files based on HNGG

CAI Courseware — CAI Courseware with Hiform Documents (822 frames); HTML Files based on HNGG

HichartED — Hichart Diagram Editing Component

LIVE — Program Variable Analyzing Component

HiTS — Translator among Hichart Diagram and C

5. CONCLUSIONS

- ◆ We proposed syntax editing mechanisms of modular tabular forms.
- ◆ We designed the system structure and the file structure of this tabular form editor.
- ◆ We developed the parsing engine based on the structures.
- ◆ We are now developing Syntax Editor and Viewer.

Acknowledgement

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Available on the WWW

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Reference

Arita, Yaku et al., Syntactic Processing of Diagrams by Graph Grammars, Proc. IFIP WCC ICS2000, 145-151