

CHAPTER – 8 WEAK SLOT-AND-FILLER STRUCTURE



Subject : AI

Code : 2180703

Prepared By:

Asst. Prof. Twinkal Panchal

(CSE Department, ACET)

Semantic Nets

The physical attributes of a person can be represented as in Fig

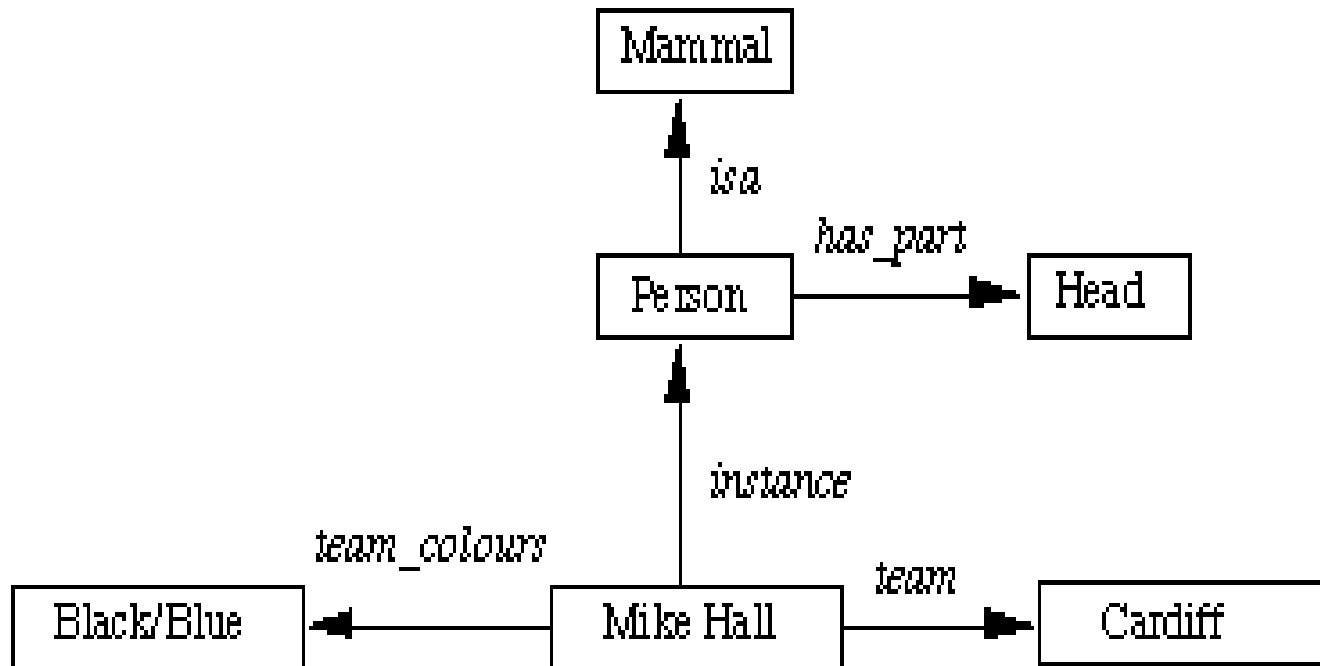


Fig. A Semantic Network

Ex- *John gave Mary the book.*

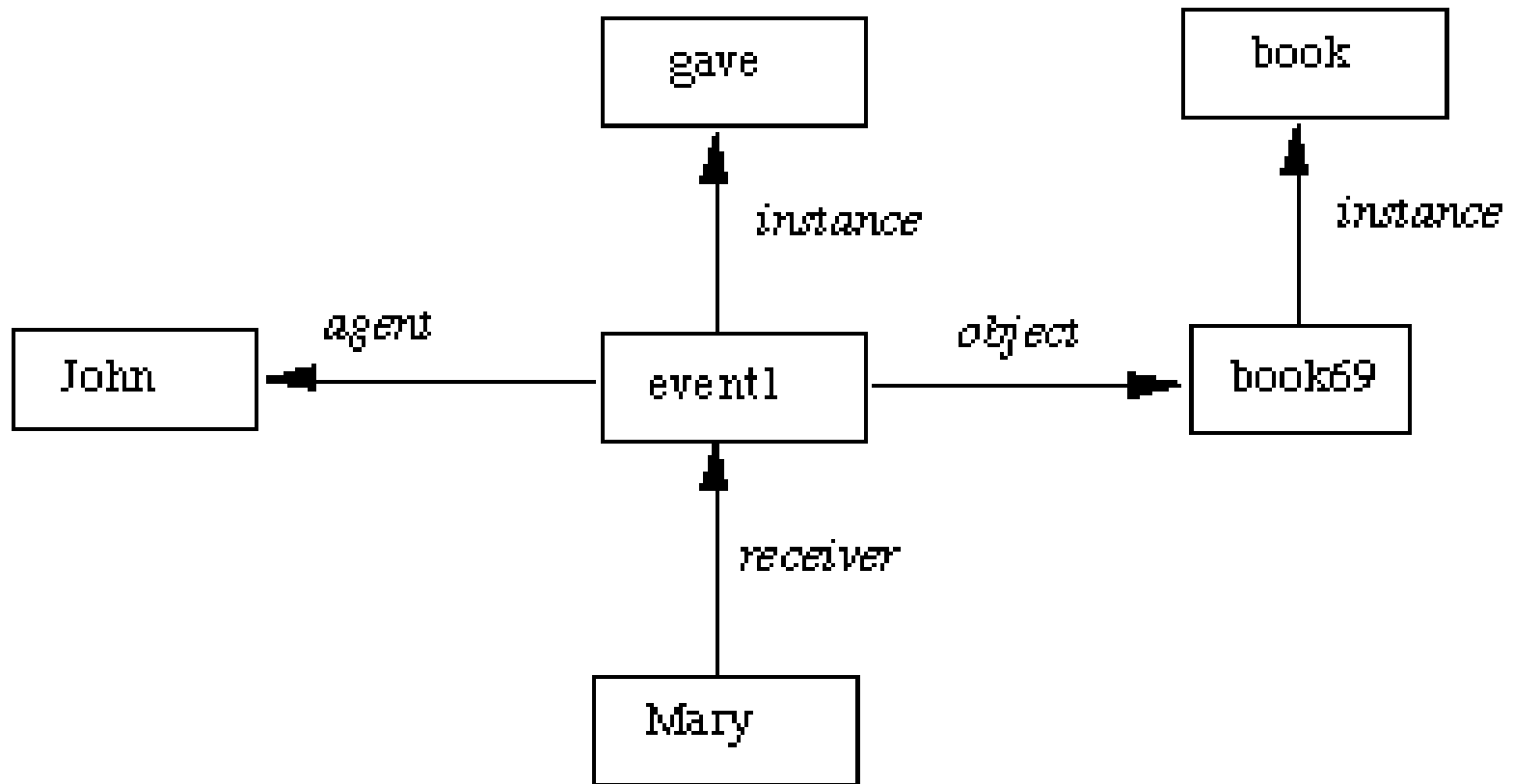


Fig. A Semantic Network for a Sentence

Partitioned Networks

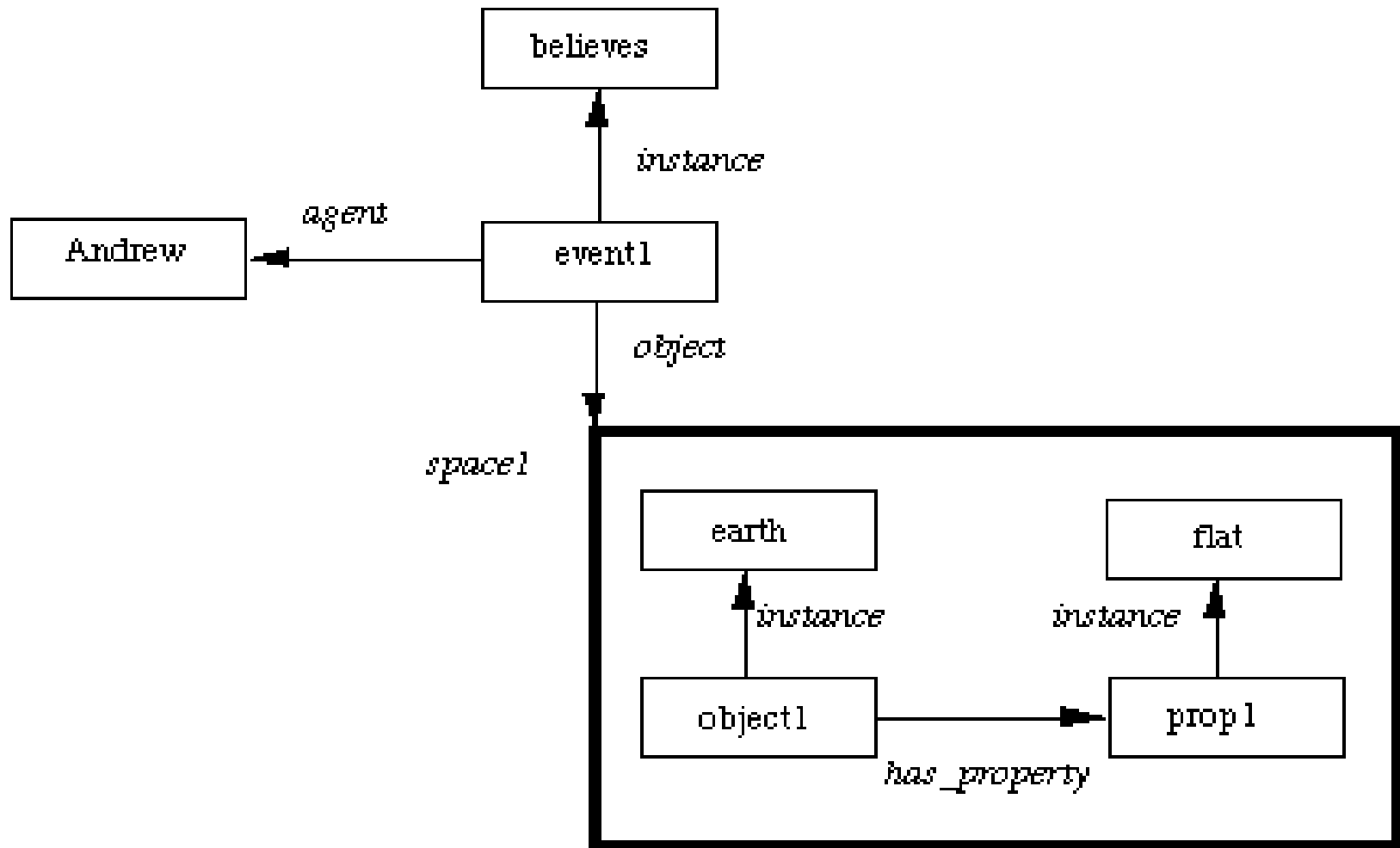


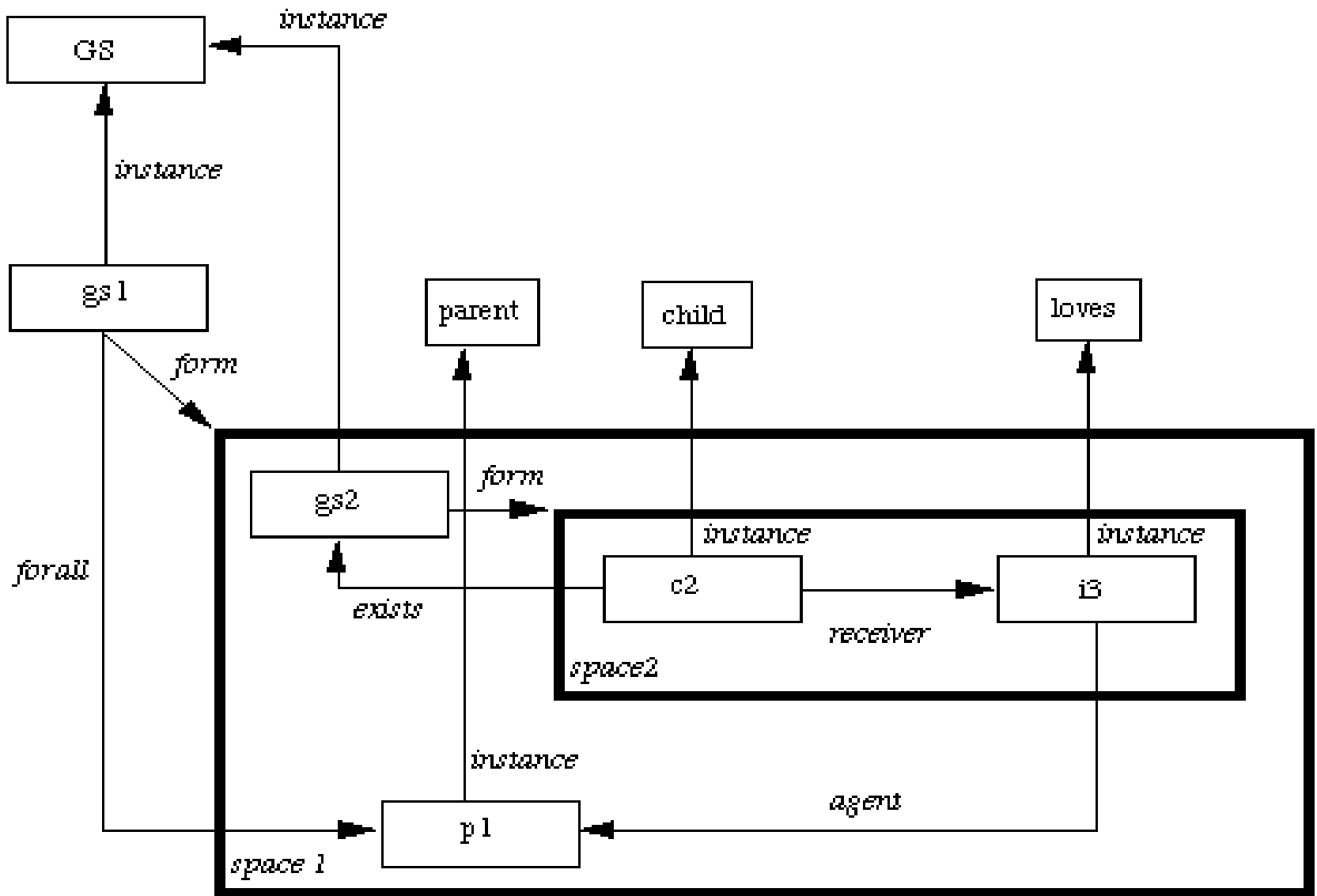
Fig. Partitioned network

Partitioned Semantic Networks allow for:

- Propositions to be made without commitment to truth.
- Expressions to be quantified.

Ex- Every parent loves their child to represent :

- Create a *general statement*, GS, special class.
- Make node g an instance of GS.
- Every element will have at least 2 attributes:
 - a *form* that states which relation is being asserted.
 - one or more *forall* () or *exists* () connections -- these represent universally quantifiable variables in such statements e.g. x, y in $parent(x) : child(y) loves(x,y)$



Frame Representation

- A frame is a record like structure which consists of a collection of attributes and its values to describe an entity in the world.
- Frames are the AI data structure which divides knowledge into substructures by representing stereotypes situations. It consists of a collection of slots and slot values.
- These slots may be of any type and sizes. Slots have names and values which are called facets.
- **Facets:** The various aspects of a slot is known as **Facets**. Facets are features of frames which enable us to put constraints on the frames.

Ex- Frame for a book

Slots	Filters
Title	Artificial Intelligence
Author	Peter Norvig
Edition	Third Edition
Year	1996
Page	1152

Ex-

- Let's suppose we are taking an entity, Peter. Peter is an engineer as a profession, and his age is 25, he lives in city London, and the country is England. So following is the frame representation for this:

Slots	Filter
Name	Peter
Profession	Doctor
Age	25
Marital status	Single
Weight	78

Advantages

- The frame knowledge representation makes the programming easier by grouping the related data.
- The frame representation is comparably flexible and used by many applications in AI.
- It is very easy to add slots for new attribute and relations.
- It is easy to include default data and to search for missing values.
- Frame representation is easy to understand and visualize.

Disadvantages

- In frame system inference mechanism is not be easily processed.
- Inference mechanism cannot be smoothly proceeded by frame representation.
- Frame representation has a much generalized approach.



Thank you!