

Modular definition of multimodal ECA communication acts to improve dialogue robustness and depth of intention

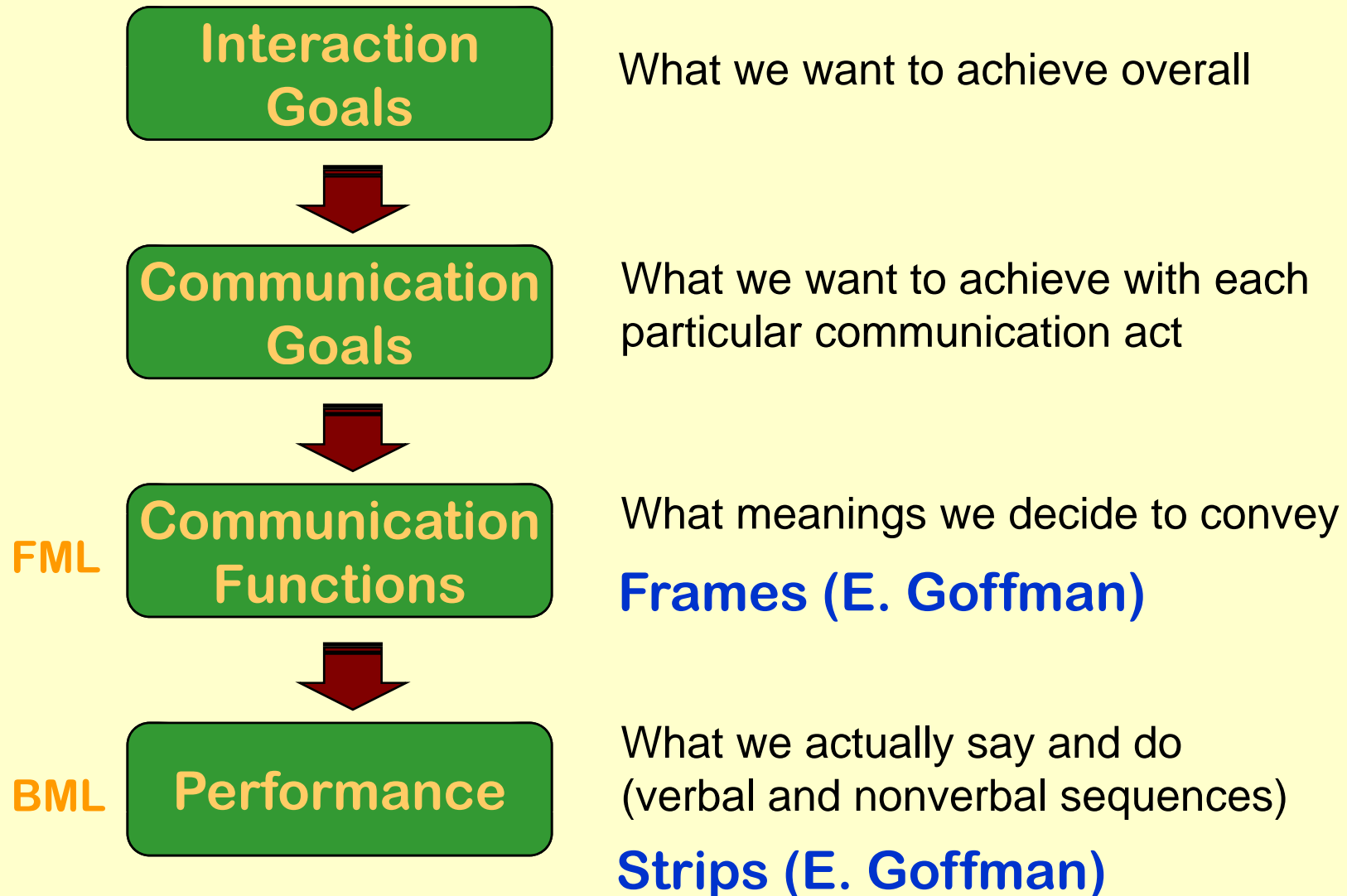
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Generating (ECA) messages



Layered goals and layered meanings (I): Theories

- **Goffman's Frame Analysis:**
 - Primary and secondary frameworks
 - Correct interpretation, misunderstanding, deception...
- **Symbol Theory:**
 - Sets of verbal and nonverbal signs to symbolise different things
- **Action-Assembly Theory:**
 - Output representation: coalition of low-level and high-level goals
- **Speech-Act Theory:**
 - Illocutionary acts: display intent
 - Perlocutionary acts: influence the listener

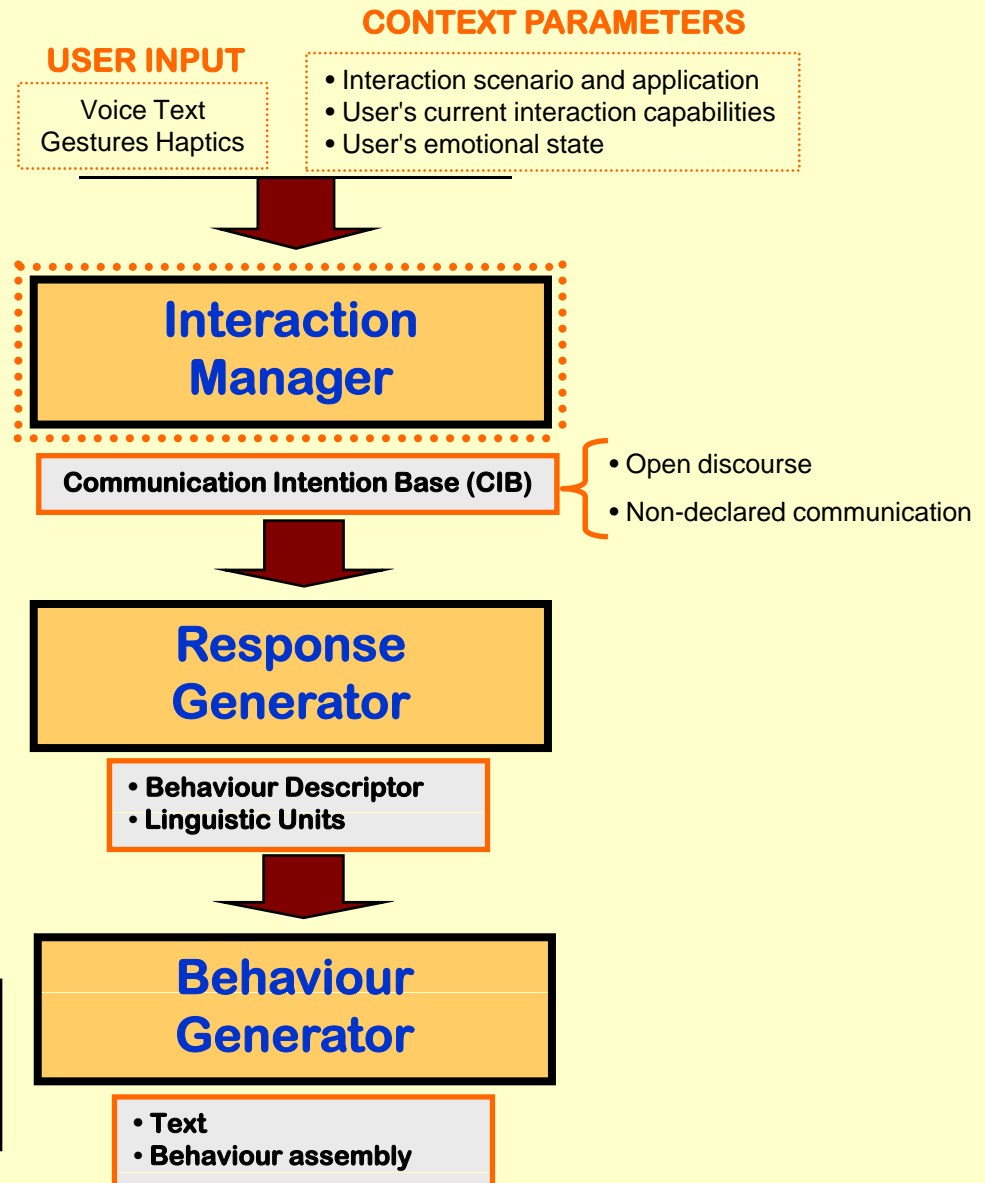
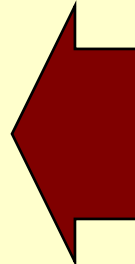
Layered goals and layered meanings (II): Problems

- How do we carry through to the final message all the information regarding **context of interaction**, **goals**, **intentions** and **speech acts**, and for different **layers of meaning**?
- Handling **complexity**: separating communication generation levels is all very well, but does "someone" have to do extra thinking?
 - How much do we put into FML?
 - Specify too much → too much for the behaviour module to *interpret*
 - Specify too little → too much for the behaviour module to *think* about
 - Should we define a level above FML specify thought processes, intentions and goals?
- What about **"nondeclared" intentions**?

The Companion ECA

- Virtual companion that "knows" the human user and continually learns through interaction
- Multimodal interaction platform:
 - Text
 - Speech
 - Touch
 - Gesture
 - Other visual elements (pictures, lists...)
- Contextual information:
 - Interaction scenario and application
 - User's interaction capabilities
 - User's emotional state
 - Background info (relevant for, or leading to, the current interaction)

Conceptual architecture



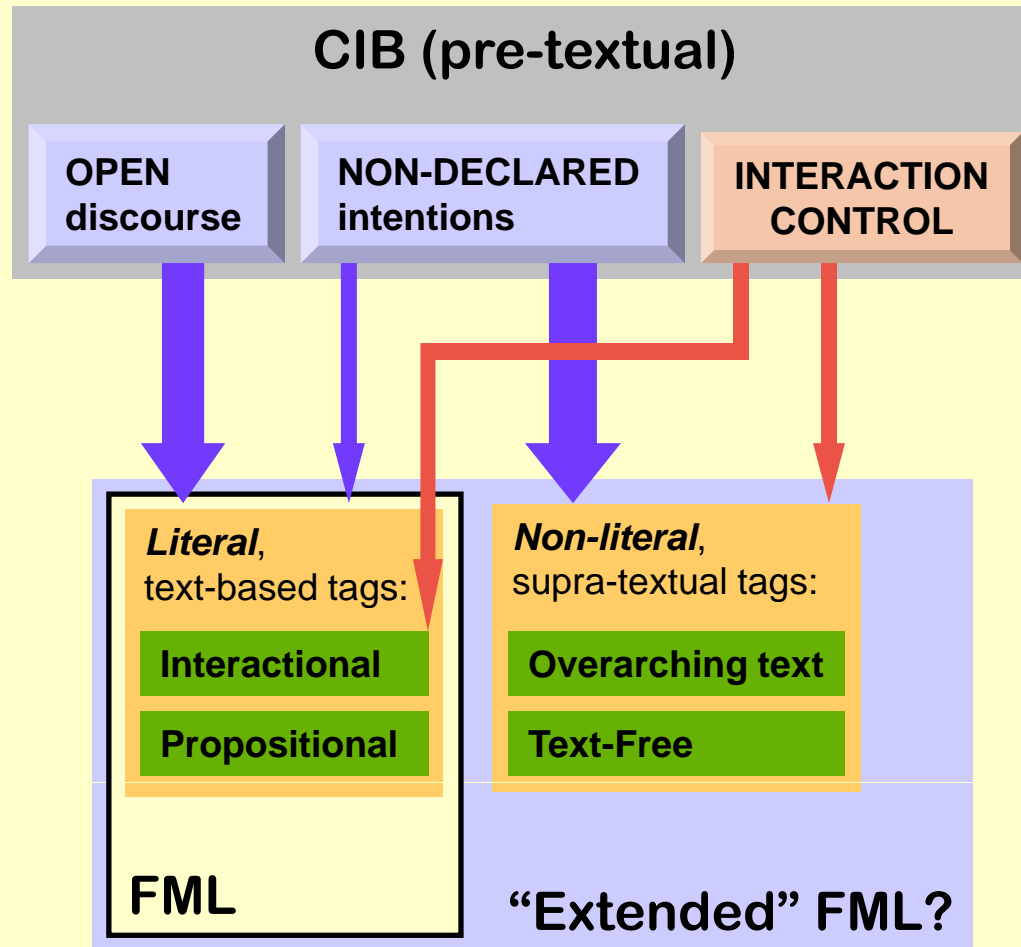
The Communication Intention Base (CIB)

Interaction Manager → CIB

- The CIB defines the ECA's response on a *pre-verbal* level.
- Elements:
 - **Interaction Control**: defines *turn management* and *theme structure*.
 - **Open Discourse**: deals with the *literal meaning* the system wishes to communicate. Abstract (text free, but literal) representation of a meaning.
 - **Non-declared Communication**: describes an *intention* –with regard to the system's interaction goals– *behind or beyond the literal meaning* of the message.
 - Sets the ECA's general attitude and emotional response.
 - Establishes certain intentions or goals that the gestures ultimately performed should aim to achieve.

There may be hidden intentions that are quite departed from the literal meaning communicated!

Extending FML



Knowledge management

- **Dialogue state**
 - waiting
 - turn taking
- **Recognition confidence**
- **Manipulation**
(conceal / focus / deceive)

Persuasion

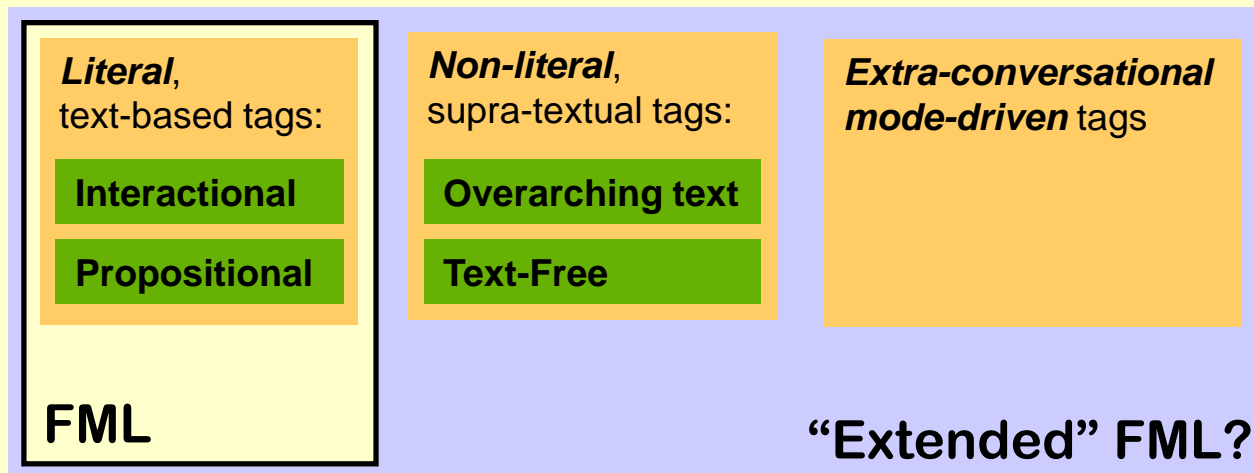
- **Speech**
- **Negotiation**

Example: Negotiation - discouragement

”Are you sure you want to eat *that*?”

```
<persuasion type="discourage">  
  <performative type="enquiry">  
    Are you sure you want to eat  
    <emphasise>  
      that?  
    </emphasise>  
  </performative>  
</persuasion>
```

Interface-mode tags



Obrigado