A scenario meeting in which the four participants (with different roles) decide to develop a new type of television remote control:

- Project Manager: meeting, project, ...
- Marketing Expert: market, product, ...
- User Interface Designer: LCD, voice, speech, ...
- Industrial Designer: battery, chip, infrared, ...

We are interested in:
- The word distribution over the role $P(w|r)$
- Will the role be helpful for topic modeling?
- Will the role be helpful for automatic speech recognition?
Using Participant Role in Multiparty Meetings as Prior Knowledge for Nonparametric Topic Modeling

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1. **Deterministic Approach:**
   
   **Factored Language Model**
   
   $$w_t \equiv f_t^{1:K} = \{f_t^1, f_t^2, \ldots, f_t^K\}$$
   
   $$P(w|r) = \text{count}(w, r)/\text{count}(w)$$

2. **Probabilistic Approach:**

   **Hierarchical Bayesian Model**

   We observed: 1) perplexity reduction for topic models comparing to the HDP, and 2) word error rate reduction for automatic speech recognition in meetings.