Term-Driven Forward-Looking Claim Synthesis in Earnings Calls

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LREC-COLING 2024

Earnings Calls

Company Manager

Professional Analysts

Outline:

- ## Prepared Remarks

  1. Operator
  2. Director, Investor Relations and Corporate Finance
  3. Chief Executive Officer
  4. Chief Financial Officer

- ## Questions and Answers

  1. Operator
  2. **Q: UBS – Analyst**
     A: CEO
  3. **Q: Credit Suisse – Analyst**
     A: CFO
  4. **Q: Credit Suisse – Analyst**
     A: CEO

  ...

Advanced Presentation Preparation

1. What You Say and How You Say It Matters: Predicting Stock Volatility Using Verbal and Vocal Cues. ACL-2019
2. Modeling Financial Analysts' Decision Making via the Pragmatics and Semantics of Earnings Calls. ACL-2019
3. Analysts' Forecasts and Asset Pricing: A Survey. Annual Review of Financial Economics. 2016

Help managers to prepare their presentations
- **Write and Refine the Speech**
- Handle the Q&A Session ➔ Generating Multiple Questions from Presentation Transcripts: A Pilot Study on Earnings Conference Calls. INLG-2023

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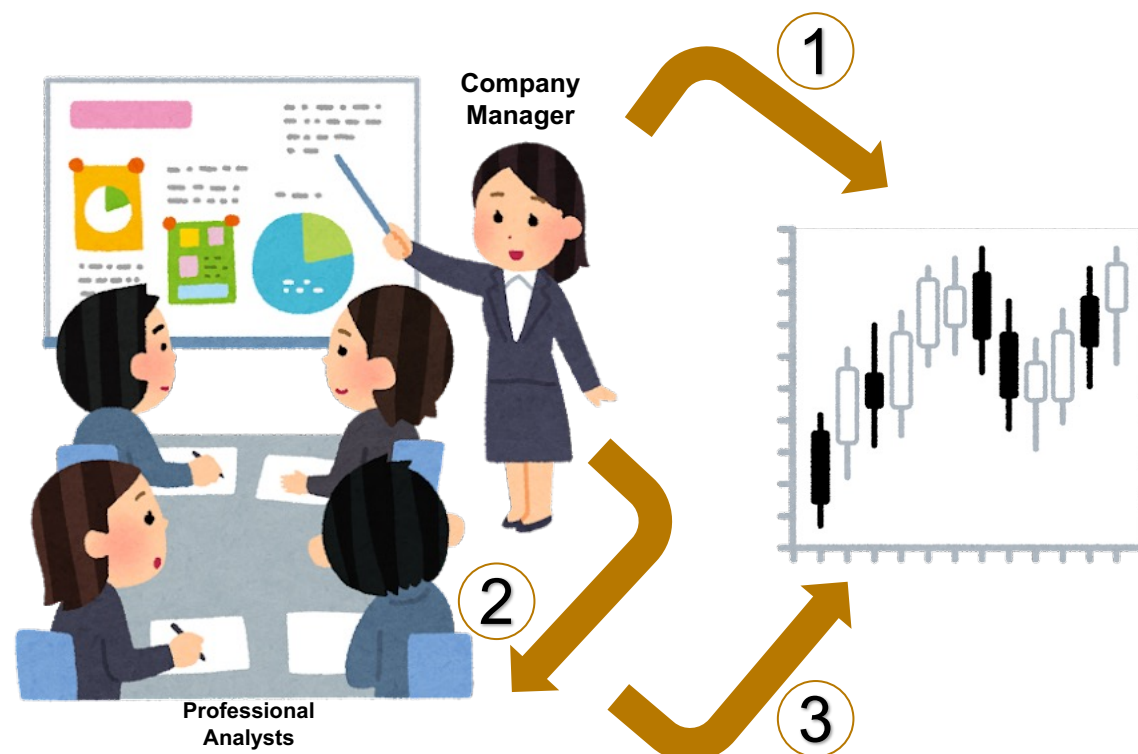
Forward-Looking Claim Synthesis

1. Define Your Goals and Audience

2. Research and Gather Information
   - Premise

3. Conceptualize and Organize Content

4. **Write** and Refine the Speech
   - **Forward-Looking Claim ➔ Which Topic (Term)? Which Number?**

5. Create Visual Aids

6. Practice the Speech

7. Handle the Q&A Session

8. Final Checks and Adjustments

Given Premise	
We have not changed our outlook on our expected 2021 **CAPEX** spend of $170 million or our restructuring spend of between $40 million and $45 million.	
Forward-Looking Claim	**Score**
CFO: In terms of Q2, we would expect **revenue** in Q2 to be flat to slightly up compared with Q2 of 2020, and we expect **adjusted EBITDA margin** to be approximately 11%.	-
T5: We expect our 2021 **CAPEX** spend to be between $70 million and $90 million, which is a significant increase from our prior guidance.	0.8594
BART: For the full year 2021, we now expect total **CAPEX** to be between $170 million and $180 million, up from our prior guidance of between $175 million to $200 million.	0.8555

Preprocessing Matters

- 34,933 Premise-Claim Pairs

- Top-50 Financial Terms (Appear more than 500 times)

Preprocessing	Example	BERT		LinkBERT		FinBERT	
		Micro-F1	Macro-F1	Micro-F1	Macro-F1	Micro-F1	Macro-F1
Original	Tesla received 14,335 orders in Europe	13.33%	6.67%	14.09%	7.15%	17.31%	10.73%
FinTerm Only	orders	16.67%	9.84%	14.79%	8.34%	16.55%	11.19%
Emph FinTerm	Tesla received 14,335 [FIN] orders [FIN] in Europe	13.71%	8.77%	14.33%	6.89%	17.33%	10.80%
Num Tag	Tesla received [NUM] orders in Europe	12.41%	6.34%	10.36%	4.99%	16.59%	10.32%
Emph Num	Tesla received [NUM] 14,335 [NUM] orders in Europe	14.24%	7.10%	14.08%	7.38%	17.98%	10.98%
Sci-1	Tesla received 1.4 [EXP] 4 orders in Europe	15.43%	8.70%	13.18%	6.65%	17.15%	10.36%
Attach	orders | 14,335	14.49%	7.91%	13.06%	7.83%	16.91%	11.97%
Emph FinTerm + Emph Num	Tesla received [NUM] 14,335 [NUM] [FIN] orders [FIN] in Europe	13.44%	8.18%	14.56%	8.28%	15.35%	9.27%
FinTerm Only + Emph Num	Tesla received [NUM] 14,335 [NUM] orders in Europe [SEP] orders	**22.31%**	**13.83%**	18.06%	11.05%	20.83%	13.56%
FinTerm Only + Sci-1	Tesla received 1.4 [EXP] 4 orders in Europe [SEP] orders	19.67%	12.44%	17.04%	11.17%	22.28%	14.79%
Emph Num + Attach	Tesla received [NUM] 14,335 [NUM] orders in Europe [SEP] orders | 14,335	19.93%	11.88%	**18.19%**	**11.46%**	20.53%	13.52%
Sci-1 + Attach	Tesla received 1.4 [EXP] 4 orders in Europe [SEP] orders | 14,335	20.37%	11.78%	16.31%	9.72%	**22.94%**	**15.60%**

Enhancing Volatility Forecasting in Financial Markets: A General Numeral Attachment Dataset for Understanding Earnings Calls. AACL-2023
Numeral Attachment with Auxiliary Tasks. SIGIR-2019

Generative Models

Preprocessing	T5		BART	
	ALL	LEAST	ALL	LEAST
Original	18.12%	26.16%	19.16%	27.87%
FinTerm Only + Emph Num	**19.73%**	**28.45%**	**20.01%**	**28.68%**
Emph Num + Attach	19.59%	28.37%	19.52%	28.25%
Sci-1 + Attach	19.31%	27.61%	19.40%	27.95%

	Appear in Input		Not Appear in Input	
Generation	ALL	LEAST	ALL	LEAST
T5	36.50%	52.54%	6.39%	9.30%
BART	33.99%	49.11%	8.89%	12.44%
Classification	Micro-F1	Macro-F1	Micro-F1	Macro-F1
BERT	22.67%	13.55%	22.01%	13.96%
LinkBERT	18.67%	11.86%	17.79%	11.08%
FinBERT	23.43%	16.22%	22.55%	15.06%

GPT-4 and Human Evaluation

	GPT-4	Human
Original	25.0%	22.5%
FinTerm Only + Emph Num	42.5%	37.5%
Same	7.5%	12.5%

Manager (GT)	We expect investment spend to pick up in the second half to circa $700 million to $750 million.
T5	We expect to continue to see a significant impact on our D&A and investment spend in the second half of '21.
BART	For the full year '21, we expect our technology and investment spend to be in the range of $40 million to $50 million, which is up from our previous guidance of $35 million to 45 million.

(1) wrong time inference
(2) wrong monetary range
(3) hallucination on previous guidance

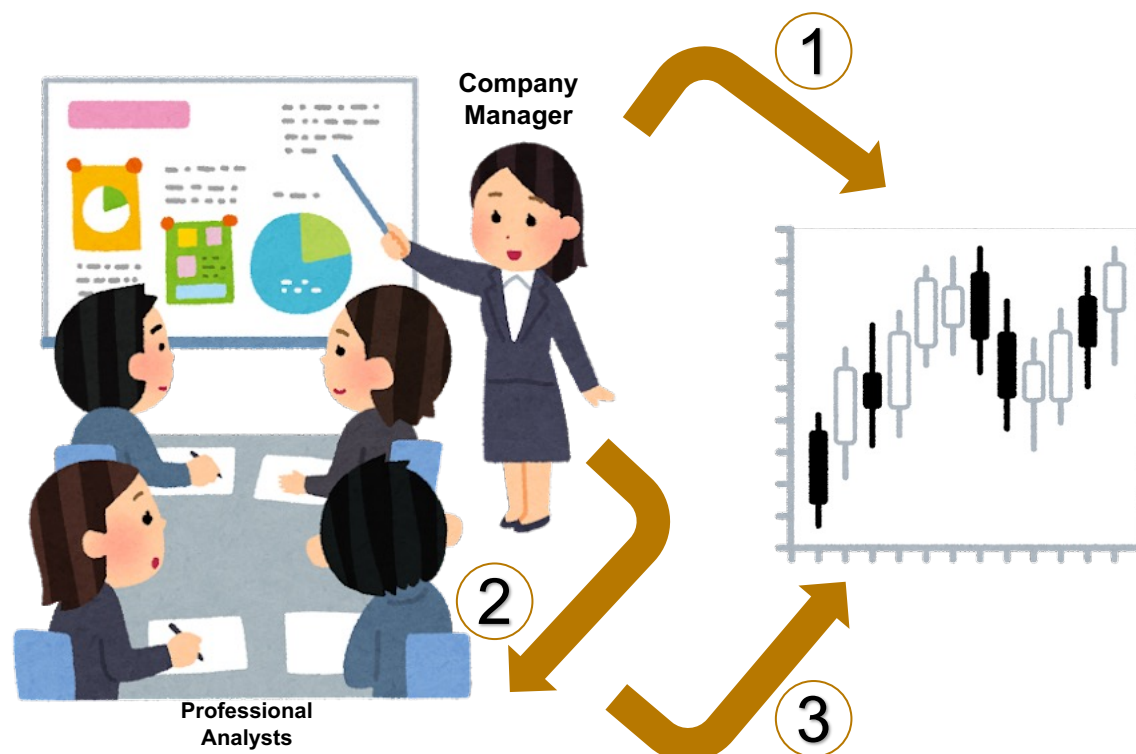# Next Step – Advanced Presentation Preparation

Help managers to prepare their presentations

- Write and **Refine the Speech**
  - **Learning from Past Presentation**
  - Considering Analysts' Concerns
    - Generating Multiple Questions from Presentation Transcripts: A Pilot Study on Earnings Conference Calls. INLG-2023
  - Considering Analysts' Reaction
  - Considering Market Reaction

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Thank You!