



Thesis presentation

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Topic

- System Dynamics Model of Handset Bundling Business.
- Goal to examine the effect of handset bundling on mobile diffusion and data usage



Structure

- Intro
- Industry Analysis
- Modeling Tools
- Theoretical Model
- Analysis of Handset Bundling Business
- Conclusion

System Dynamics

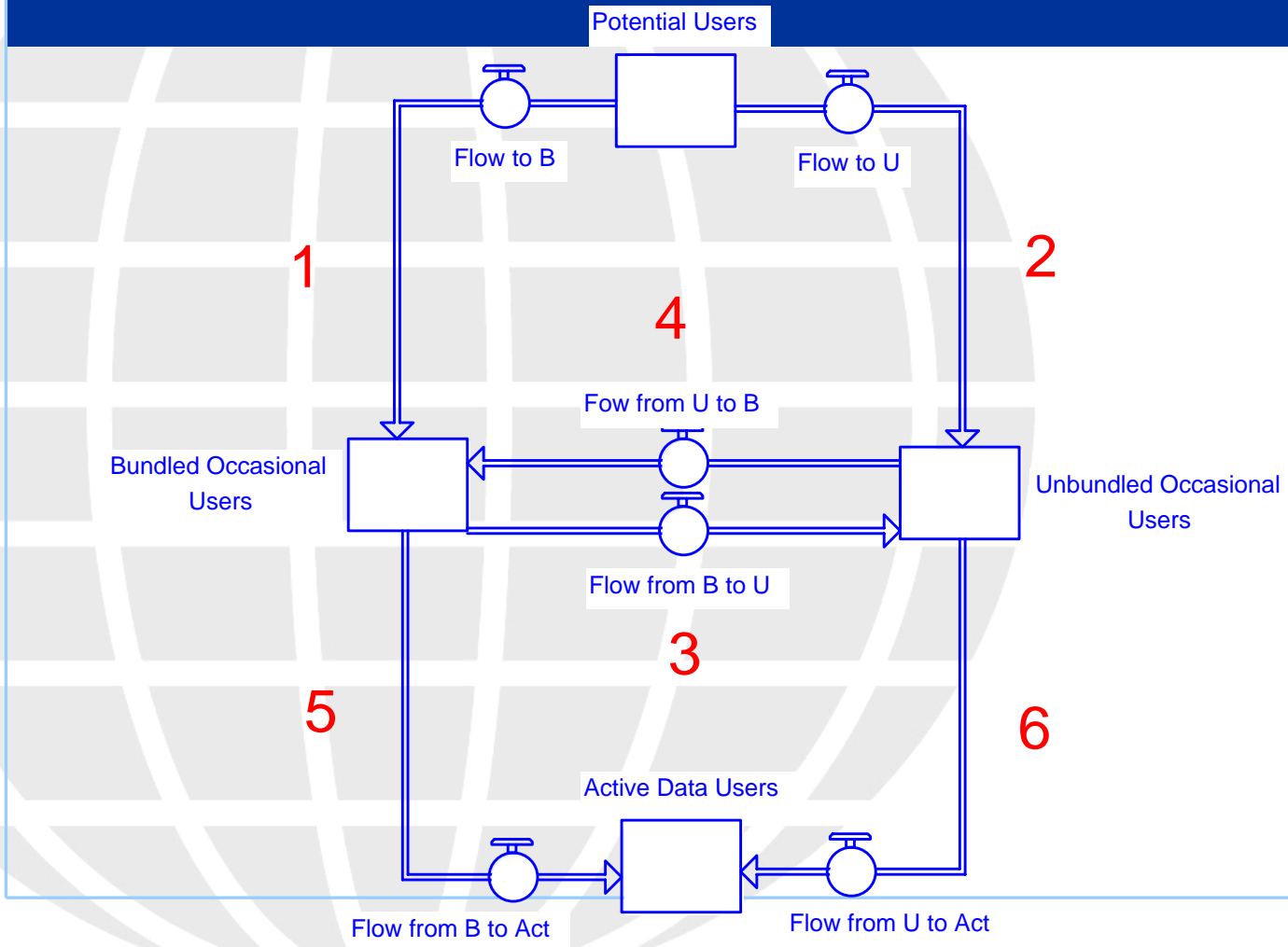
- Founded by Jay W. Forrester at MIT
- Stocks
 - Term for any entity that accumulates or depletes over time
- Flows
 - Rate of change in a stock
- Feedback loops and delays

The Model

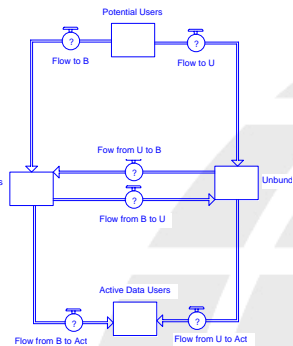
- Diffusion and Adoption Approach
- Bass Model Implementation
 - External (advertising) and Internal (word-of-mouth) influence
- The model consists of stocks and flows

Challenges

- Quantitative analysis is always challenging
- Picking the most influential interactions
- Data can be confusing
- Novel approach



Flows



Name	Description	Modeling
1	Flow from potential adopters stock to bundled adopters of occasional data users	Bass - Advertising and Word-of-Mouth
2	Flow from potential adopters stock to unbundled adopters of occasional data users	Bass - Advertising and Word-of-Mouth
3	Flow from bundled occasional to unbundled occasional data users	Transition after contract period
4	Flow from unbundled occasional to bundled occasional data users	Rethink when buying phone
5	Flow from bundled occasional to active data users	Usability of Internet Services Preconfigured Service Effect
6	Flow from unbundled occasional to active data users	Usability of Internet Services

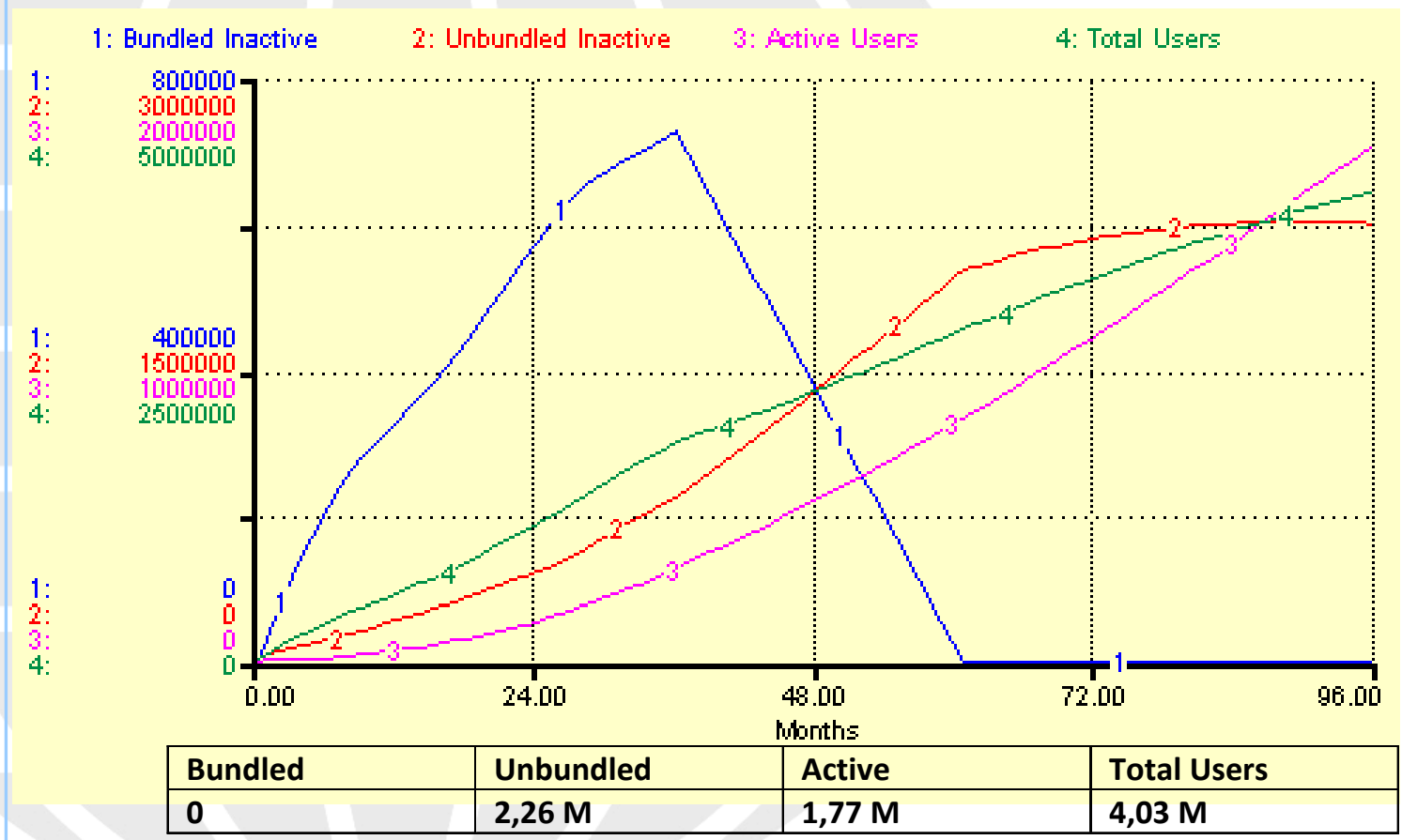
Model Boundary Chart

Endogenous	Exogenous	Excluded
Diffusion rates	Subsidy	Network congestion
Bundled users	Contract length	Quality of service
Unbundled users	Population	Price
Active data users	Bundling decision	
Internal influence	Innovation coefficient	
External influence	Imitation coefficient	
	Network coverage	

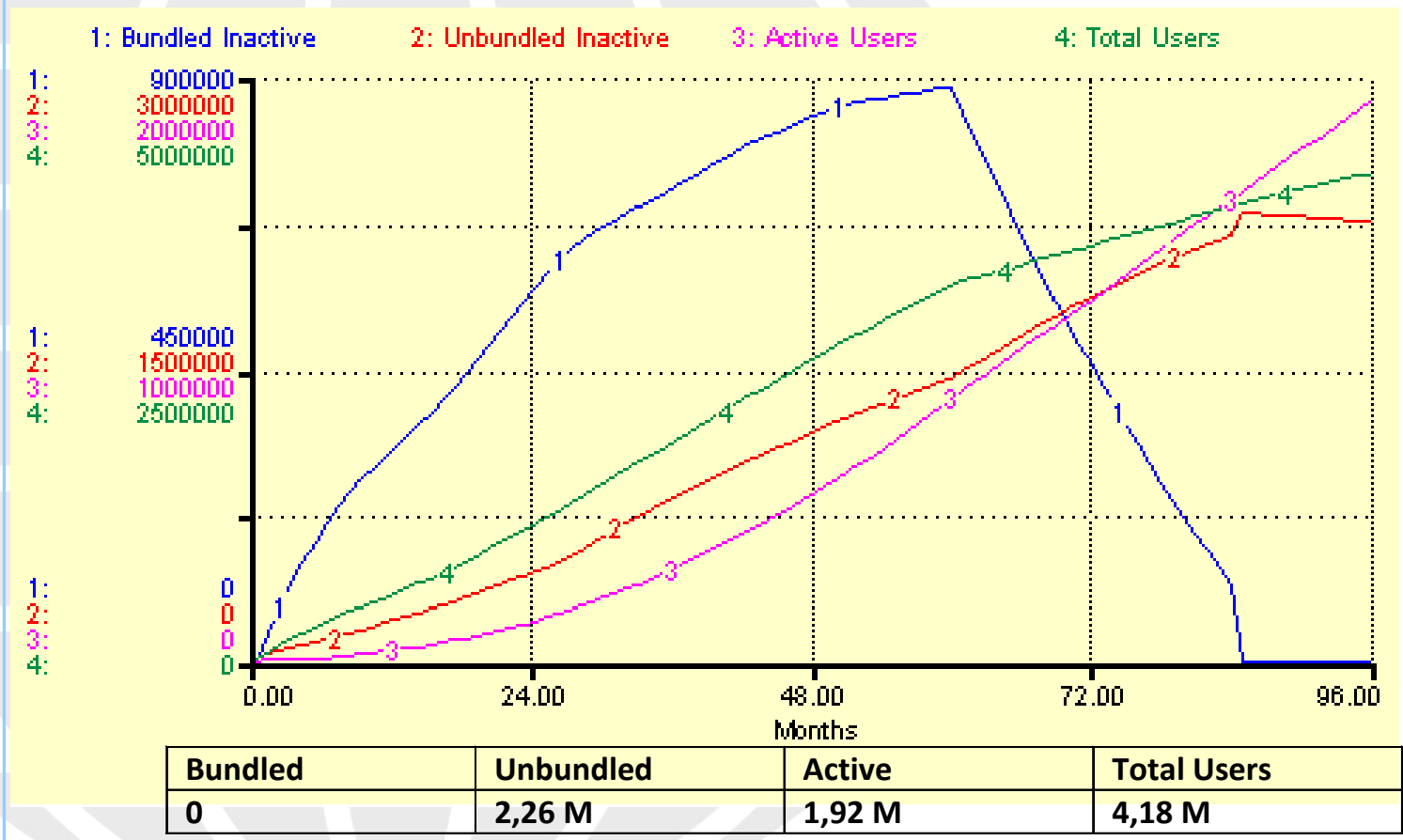
Observations

- Handset bundling has hardly any direct influence on mobile data usage -> only the indirect statistical significance through larger handset population
 - Preconfigured service effect
- Handset bundling boosts the 3G handset diffusion at first but the effect is inclined to slow down in time

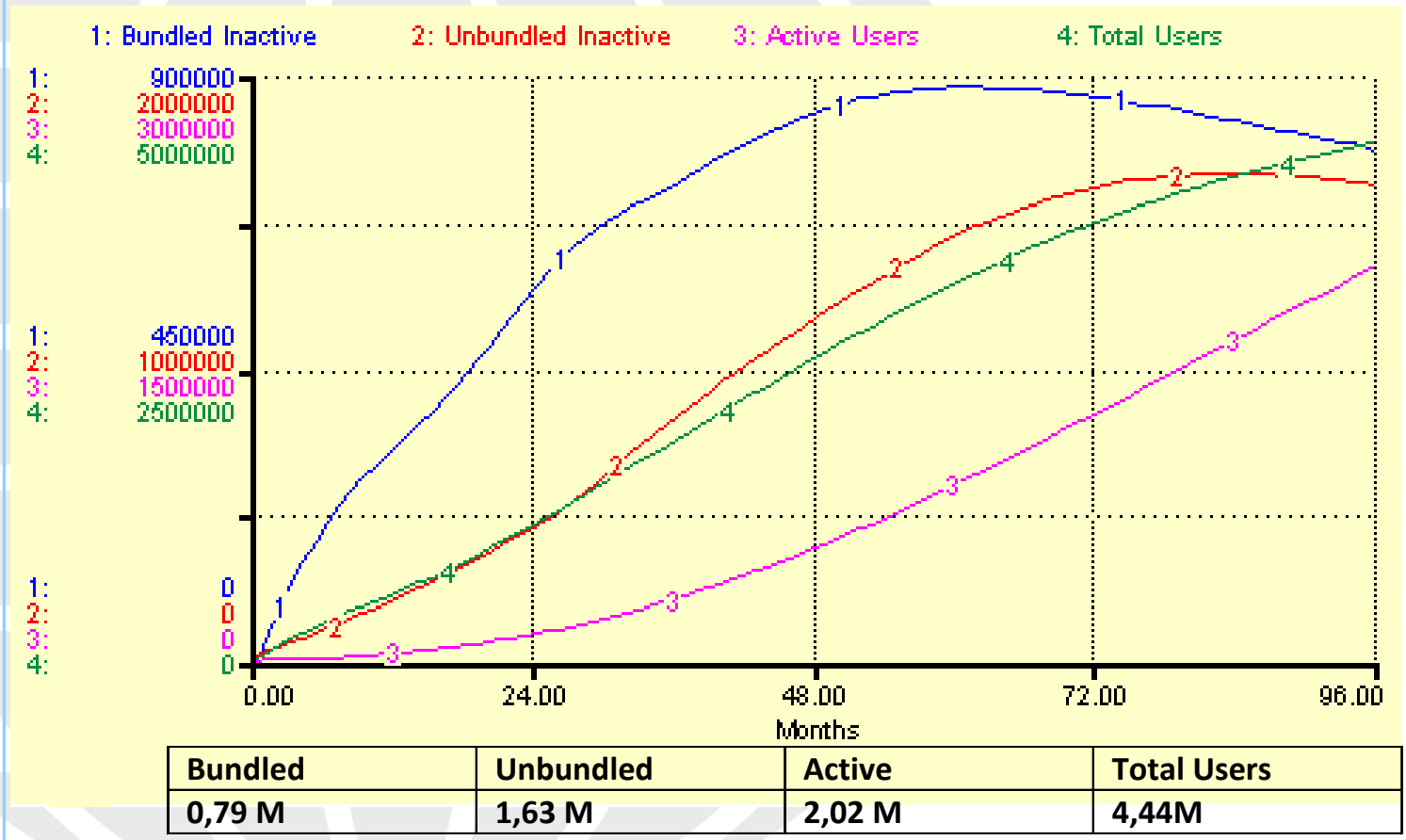
36 Months



60 Months



96 Months



Results

Scenarios	Bundled	Unbundled	Active	Total Users
36 Months	0 M	2,26 M	1,77 M	4,03 M
60 Months	0 M	2,26 M	1,92 M	4,18 M
96 Months	0,79 M	1,63 M	2,02 M	4,44 M
The Least Lucrative	0,14 M	2,20 M	1,88 M	4,22 M
The Most Lucrative	0,96 M	1,47 M	2,06 M	4,49 M

Results

- Extending handset bundling law only slightly increases the penetration of next generation handsets during study period
- The most influential time frame was in the beginning of the handset bundling legislation change
- Handset bundling will have other implications on market however

Discussion

- First public quantitative analysis made on Finnish mobile markets
- Partly insufficient representation
- Basis for future evaluation and research

Future Research

- Operator Focus
 - Effects on operator business and competition
- Monetary Evaluation
 - Operator benefit
- Link to Business Games
 - Industry representation and modeling



Thank You!

Questions?

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