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Market Model Design and Systems Thinking As Decision Support  
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## 1 Executive summary

<b>Title:</b> Market Model Design as Decision Support - Public Wireless LAN Market Dynamics As A Case Study	<b>Author:</b> Roman Pixell <b>Tutor:</b> Doctor Patrick Sweet <b>Examinator:</b> Karl Olof Hammarkvist
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### Abstract

It is a difficult task to plan and decide about complex issues, such as an infrastructure rollout. There are many tools for decision support, but very few of these tools offer a visual, comprehensible overview of the causality in a complex environment and the possible implications of a decision. The system dynamics interface offers a visual overview of causalities; the case study involves modelling of the market for wireless Internet service providers (operators) with the aid of system dynamics tools.

### Case Study

Wireless computer networks have rapidly achieved a wide market acceptance since 1999. Until recently, telephone systems have been the unchallenged bearers of public data traffic in a mobile context. Lately, there have been questions raised about the possibilities of using alternative technologies for data transfer; proponents to wireless computer networks as a substitute for mobile telephony data transfer in a public environment have even questioned the planning of a third generation mobile infrastructure. In this study, a fictive market for public wireless networks is modelled in a system dynamics interface.

### Purpose

The research purpose is to investigate how a given performance measure – in this case cash flow – is affected by different parameters in a causal model, for public wireless computer networks on the Swedish market, in order to visualise the actual system. The model is intended to help the explanation, understanding and possibly even prediction of the market for public wireless computer networks, by enabling the testing of possible scenarios,

### Method

Market data was collected from various primary and secondary sources; assumptions have been made where real market data was missing (for example certain market model components, such as the wireless network roaming brokerage). The mental causality models have been formalised with modelling software from Powersim AS.

### Conclusions

System dynamics is a compelling alternative methodology to current modelling tools by offering rapid causality overview, flexibility, transparency, consensus building and many other advantages; but there are also caveats, such as a high learning barrier as well as a high introduction cost and software limitations. Even though the study is foremost an explorative method study, some conclusions can also be drawn regarding the case. Wireless computer networks offer an economic opportunity with organic infrastructure rollout of a mobile network for data traffic, but the implementation will not be problem free. Many uncertainty factors, such as terminal penetration, roaming brokerage, system integration and customer support, can delay the break-even and ruin the most positive scenario.

### Key words

802.11b, Cash Flow, Causal Loop, Decision Support, Decision-making, Ithink, Market Modelling, Telia, Telia HomeRun, Telia Research, PowerSim, Stella, System Dynamics, Systems Thinking, Wireless, Wireless Networks, WLAN, WISP.