

Game Theory and Mobile Operator Business

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Overview

- Introduction
 - Definitions, motivations and area of application
- Game Classifications
- Game Equilibrium
- Game Theory in Mobile Industry
- Game Theory in MOB
- Inference

Introduction

- Game theory existed since ancient times
- 1944: Mathematical theory invented by Neumann and Morgenstern.
- What is a Game?
 - All Situations in which at least *an agent* can only act to maximize his *utility* through *anticipating the responses* to his actions by one or more other agents. Agents here mean players.
- What is Game Theory (GT)?
 - Study of ways in which *strategic interactions* among *rational players* produce *outcomes* with respect to the *utilities* of those players, none of which might have been intended by any of them.

Motivations

- Improves strategic decision making
- Helps in running business and evaluating policies.
- Helps in becoming better managers and economists.

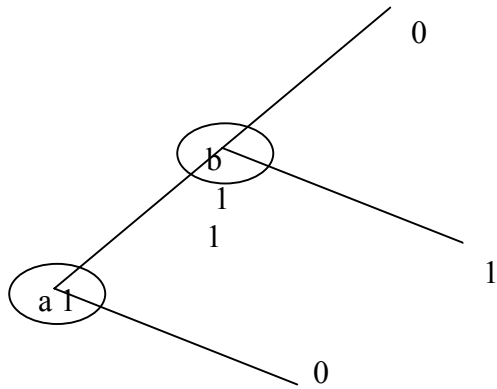
Areas of Application

- Business
 - Monopoly, Duopoly, Oligopoly
- economics
- Politics
- Finance
- Sports
- Health etc

Game Classifications

- Move-based
 - Static and Dynamic
- Information-based
 - Perfect/imperfect
 - Complete/incomplete
- Representation
 - Extensive form
 - Normal form

Representation



Extensive form

		P2	
		Deny	Confess
P1	Deny	-1,-1	-9,0
	Confess	0,-9	-6,-6

Normal Form

Classification contd..

- Strategy-based
 - Pure and Mixed
- Utility-based
 - zero-sum
 - constant-sum
 - variable-sum

Game Equilibrium

- steady-state condition
- Nash Equilibrium
- Prisoner's dilemma

GT in Mobile Industry

- Mobile Industry is oligopolistic
- Bidding/Auctions
 - static games with incomplete and imperfect information
- Bargaining
 - dynamic games with complete and perfect information
- Competitive advantage
 - Pricing
 - multi-stage game with complete and imperfect information
 - New services roll-out
 - n-person zero sum game
 - Coordination
 - n-person variable-sum game

GT in Mobile Industry contd...

		P2	
		New service	wait-and-watch
P1	New service	0,0	a,-a
	Wait-and watch	a,-a	0,0

		P2	
		Tech. 1	Tech. 2
P1	Tech. 1	1,1	00
	Tech. 2	0,0	1,1

GT in MOB

- MOB
 - Simulated mobile industry and market environment
 - Risk-free
 - Multi-stage game with complete and imperfect information

Inference

- Mobile industry is one of the fastest growing.
- Customers, operators and regulators play key roles.
- Understanding of dynamics essential for decision makers
- Game theory: valuable tool for analysis

Thanks

Q&A

Life is a game. Can you model it?
How?

- Life
 - A one-person multi-stage game with incomplete, imperfect and asymmetric information.