

# Technologies for Information Systems

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Duration: 1h45min

Prof. F.A. Schreiber

Prof. L. Tanca

Name: _____
Surname: _____
Student ID: _____
Signature: _____

PoliTV is a television network company and it has many thematic channels. The management of PoliTV has asked you to design its data warehouse in order to be able to analyze the audience ratings (e.g., number of viewers) and the advertising income. The following is the logical schema of the PoliTV operational database:

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ThematicChannel(Channel-ID, Name, TVFrequency, Topic, Language)
TVProgram(Program-ID, YearOfProduction, Producer)
Advertisement(Adv-ID, Adv-Topic, Producer, Length)
Advertise(Channel-ID, Adv-ID, Date, Timeslot, Income)
Viewer(Viewer-ID, Name, Surname, YearOfBirth, City, Country)
Schedule(Channel-ID, Date, StartTime, Program-ID)
Watches(Viewer-ID, Channel-ID, Date, StartTime)
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1. Perform the reverse engineering of the given logical schema into a conceptual schema.
2. With respect to the produced conceptual schema:
  - (a) Discover the fact(s) that are useful to monitor PoliTV's activities. For each of them:
    - i. Identify measures (with their glossary) and dimensions (with their hierarchies) and produce the attribute tree (with pruning and grafting).
    - ii. Produce the conceptual schema (fact schema).
  - (b) Produce a star schema or snowflake schema (with related discussion/motivation) consistent with the conceptual schema and such that it allows the following queries:
    - i. select the total advertising income for each weekday
    - ii. considering only the first semester of year 2009 and only sport channels, select the total number of advertisements and the total income for each pair (channel, timeslot)
    - iii. select the timeslot with the highest income
    - iv. for each channel select the program with the highest audience (i.e., number of viewers)
  - (c) Write the above queries in SQL.