CURRENT TOPICS IN COMPUTER SCIENCE

Business Intelligence Systems and Analytics
COURSE OVERVIEW

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CONTACT

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- Course site (ILIAS):
  - https://elearning.vgu.edu.vn

COURSE INFORMATION

- Major: Computer Science
- Course Name: Current topics in Computer Science
  - Lecture and Seminar periods: 60
- Schedule
  - 21.11.2023-11.01.2023 (the first 2 weeks on Tuesday, the rest on Thursday)
  - Exam date: 18.01.2024

COURSE OUTCOMES

- By completing the course, students will be able to:
  - Explain the related concepts
  - Analyze challenges
  - Design a business intelligence system and data warehouse
  - Apply principles as well as techniques into their real-life projects.

COURSE OUTLINE (1/2)

- Day 1: Introduction and problem statements
- Day 2: OLTP vs. OLAP and dataset investigation
- Day 3: Data warehouse design
- Day 4: ETL and data integration challenges
- Day 5: Data mining
- Day 6: Data mining (cont.)
- Day 7: Decision support system and Business intelligence system
- Day 8: System integration
- Day 9-15: Business Intelligence Projects based on given topics. Students are encouraged to employ design principles and techniques in order to analyze, design, and implement their systems based on their particular topics as follows:
  - Topic 1: Sales and forecast
  - Topic 2: Product mix and clustering
  - Topic 3: Product and association rules
  - Topic 4: Promotion and clustering
  - Topic 5: Reseller and classification
  - Topic 6: Market region and clustering
  - Topic 7: Customer and segmentation

COURSE OUTLINE (2/2)

- Day 9-10: Database self-exploration and problem statement based on the topics
- Day 10-11: Problem statement and system design
- Day 12-13: System implementation progress
- Day 14-15: Final presentation

REFERENCES

1. **Tobias Zwingmann, “AI-Powered Business Intelligence,” Kindle Edition, O'reilly Press, 2022.**
2. **Jiawei Han, Micheline Kamber, “Data Mining: Concepts and Techniques,” Third Edition, Morgan Kaufmann Publishers, 2012.**
3. David L. Olson, Dursun Delen, “Advanced Data Mining Techniques,” Springer-Verlag, 2008.
4. Jeen Su Lim, John Heinrichs, “Digital Business Intelligence Management with Big Data Analytics," Kindle Edition, O'reilly Press, 2021.
5. William H. Inmon, “Building the Data Warehouse,” Fourth Edition, Wiley Publishing, Inc., 2005.
6. **R. Kimball, M. Ross, "The Data Warehouse ToolKit," 3rd Edition, Wiley Publishing, Inc., 2013.**
7. Turban, E., Aronson,J.E., “Decision Support Systems and Intelligent Systems” - 7th Edition, Prentice-Hall, 2005.
8. Ramesh Sharda, Dursun Delen, Efraim Turban, “Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support,” 7th Edition, Pearson Education, Inc., 2020.

ASSESSMENT

- Seminar: **50%**
  - **Teamwork**
  - **Submission: Report, member list, and system resources**
- Final exam: **50%**
  - Written exams in 90 minutes
  - Open-book (NO smart devices)

TOPIC INTRODUCTION

- Business intelligence system is essentail for most of business today. It helps businesses not only visualize their data, measure their performance of all kinds, but also optimize their operations.
- Other than business intelligence, business analytics facilitates businesses with true insights hidden from their operational data and supports decision making. In order to achieve the goals, a series of system designs and solutions have to be examined and developed from the business transactional data.

TEAM REGISTRATION

SEMINAR SUBMISSION

- Submission by scanning QR
- Seminar: **50%**
  - **Submission**
    - **Create your folder with its name: “<TeamNo>_<SubmitterFullName>.zip”**
    - **Report, member list, and system resources**
    - **Due date: before 11pm 07.01.2024**
  - **Final presentation date: 11.01.2024**

GENERAL RULES

- Using laptops & smart devices is encouraged for learning activites in class.
- If anything is unclear, please ask your lecturer.
- Team leaders, along with teammates, manage their own team work
- Be active! Learning together!

PROGRAM PREPARATION (1/3)

1. MS SQL Server
   Standard/Developer/Enterprise/Evaluation edition
   - Click here to download SQL Server 2022
2. MS Visual Studio
   - Click here to download MS Visual Studio 2022
   - SQL Server Integration Services Project extension in MS Visual Studio
   - MS Analysis Service Project extension in MS Visual Studio

PROGRAM PREPARATION (2/3)

1. MS SQL Server data tools
   - Click here to download SQL Server Data Tools for visual studio
2. MS SQL Server Integration Services Projects
   - Click here to download SQL Server Integration Services Projects
3. Microsoft PowerBI
   - Click here to download MS PowerBI Desktop
4. PostgreSQL
   - Click here to download PostgreSQL

PROGRAM PREPARATION (2/3)

1. Jupyter Notebook
   - Click here to download Jupyter Notebook
   - Python libraries
     - ✓ pandas
     - ✓ numpy
     - ✓ matplotlib.pyplot
     - ✓ sklearn
     - ✓ seaborn
     - ✓ missingno
     - ✓ warnings

QUESTIONS AND ANSWERS