

Major Assignment 2 | Scenario, structure, and guidelines | F23

Parallel Dynamics needs new ETL software (extract, transform, load), and your department manager is asking you to recommend which product they should acquire. The analysis will focus on known objectives and constraints and be presented as a structured recommendation report. The document will contain 2,000 - 3,000 words, references, and an appendix.

Background

Parallel Dynamics Inc. (PDI) is a global leader in augmented discovery, seamlessly integrating augmented reality (AR), virtual reality (VR), high-performance computing (HPC), and quantum computing. With its mission of "solving today's problems with tomorrow's technology," PDI has grown rapidly. It has offices in four countries and longstanding relationships with more than 25 high-profile customers, including leading tech firms, government agencies, and research institutions. Each involves large contracts, long-term partnerships, and critical projects with substantial technological and financial implications. Furthermore, the company has a significant number of smaller customers.

PDI's fast ascent over only five years has come with challenges. One of the most pressing is the exponential growth in the company's data handling needs, directly linked to its expanding customer list and enhanced service offerings.

Situation

As a startup, PDI used standard ETL software. While this served its initial purpose, allowing PDI to extract data from various sources, transform it into a usable format, and then load it into their system, the existing ETL system is reaching its functional limits. The scalability, speed, and versatility once deemed sufficient are now lacking, especially given the volume from the company's expanded global operations and the complexity of the data sets. The company needs forward-capable software in every aspect of its operations to support PDI on its trajectory of high-impact innovation with reliable delivery. The ETL upgrade is the latest in a series being done by the company.

The nine-member PDI senior leadership team will make the final decision. This multi-disciplinary group includes the CEO, chief technical officer (CTO), chief financial officer (CFO), chief scientist, and area heads for global operations, product design and development, sales and marketing, trust and safety, and legal.

Objectives & constraints

The senior leadership team believes the need is essential to meet the next wave of PDI's growth. They want the replacement ETL software to achieve at least the following objectives:

Speed - The new software must allow faster data extraction, transformation, and loading, enabling real-time data analytics and decision-making from complex data sets.

Scalability - The software should be able to process PDI's ever-growing volume of data without performance degradation or inefficiencies.

Global compatibility - As PDI operates in multiple countries, the software should support multi-region data integration, understanding different data regulations and formats across the globe.

Security - Given PDI's high-profile customers and the sensitivity of their data, the ETL software should be fortified with advanced security measures to protect against breaches and unauthorized access.

Note pricing is neither **an objective nor a constraint**. PDI wants to deliver on its mission of "tomorrow's technology" and believes its ambition should not be constrained by cost. However, the company **has constraints in four areas**:

- A. **Migration** - Transitioning legacy data from the old ETL software must be achievable with minimal disruption, downtime, or data loss.
- B. **Integration** - The new ETL software must be compatible with PDI's existing IT infrastructure for AR, VR, HPC, and quantum computing systems. It should not require a significant overhaul of workflows.
- C. **Training and ease of adoption** - The new software must be suitable for swift adoption by teams in different regions, factoring in potential language barriers.
- D. **Vendor support & reliability** - The chosen ETL software vendor must provide robust post-sale support, including regular updates and timely responses to unanticipated issues. The vendor's industry reputation should reflect reliability and experience.

Task

Research **three options for new ETL software suitable** for **PDI and recommend one** that best satisfies the above objectives and constraints.

To provide a comprehensive recommendation for the company, structure your findings in a report as follows:

- (1) **Executive summary** - A reader should get a quick sense of the entire report in this section, including brief statements of the problem, methods to reach a conclusion, and the outcome. Note: Although this section appears first, it summarizes the whole report and is best written last. About 250 words. Apply conventions of a summary.
- (2) **Introduction & context** - Describe
- the intent of the report and how it will be used by its audience (both primary readers and secondary readers)
 - the background that prompted the report
 - the company's objectives for the ETL product to be chosen and also their constraints for product selection
 - the names of the three products you have selected for analysis, with a brief statement of why you chose these three.
- About 250-500 words. Apply conventions of a summary.
- (3) **Options** - For each of the three products you identified, summarize the main features, specifically those that address PDI's needs. Also note any potential risks associated with each one, considering PDI's concerns. About 250 - 350 words for each of the three you select. Apply conventions of summaries.
- (4) **Comparative Analysis** - Develop a weighted objective table for the three ETL software tools, evaluating them against PDI's objectives. Ensure each criterion is assessed quantitatively for each product, ensuring the weights and scores are visible in the table. Explain the rationale you used for the weightings.
- After the weight objective table, discuss the constraints. Make it clear if each product meets, partially meets, or does not satisfy the constraints. This may be presented in a checklist table or as a narrative description. If a product only partially satisfies a constraint, explain why and the implications.
- Weighted comparison table + explanation and discussion of constraints - About 250-500 words. Apply conventions of a summary.
- (5) **Conclusions** - Summarize the findings from the comparative analysis. Which software is best for each objective? Which has the highest score overall? Is this outcome affected by the constraints? Does the analysis of the constraints alter or reinforce the choice favoured in the analysis of weighted objectives? About 250 - 500 words. Apply conventions of a summary.
- (6) **Recommendations** - Clearly state one product you recommend and your primary reason(s). Note: Some readers will look only at this section. The recommendation must be consistent with the preceding analysis but cannot rely on the reader reading the conclusions. Include four actionable and clear steps PDI should take to deploy the recommended ETL software in its operations. About 250-350 words. State your opinion, supported by preceding facts.

- (7) **References** - All facts, figures, quotes, and claims must be from reliable sources. Include inline citations and a comprehensive reference list. *Numbers will match the citation numbers in the report.*
- (8) **Appendix A: Source validation** - Provide a concise rationale justifying the reliability of **sources** not from academic papers in the Dalhousie database. Briefly state pertinent details to assure the source's credibility. *Numbers will match the reference numbers they describe - see example in the reference slides for November 10.*

Reports will be assessed on their logical reasoning, clarity for the intended audience, coherence, and readability, together with the reliability of the source information. See the rubric for details.

Additional guidelines

- **TECHNICAL ENGLISH** - Use conventions for Technical English throughout the document. This includes making the writing predominately in the active voice. "Predominantly" is an impression more than a word count; however, think of it as more than 66% of the writing.
- **ILLUSTRATIONS & LISTS** - Use **up to two lists and up to two tables** in the report. The tables **must be original to you**. You also **may use figures from third parties** that you correctly label and cite.
- **SOURCES** - Assess the three products using at least three separate sources for each one. A "separate source" is both (a) from a different publisher, not a different section of the same website, and (b) from a source not used for the other products. One of the three may be the software vendor for product specifications and other facts but not for the vendor's promotional statements. For references found online, make all URLs clickable. We will be verifying all sources.
- **GENERATIVE AI** - Sections 1,2,4,5,6 must be written in your original words. Using an LLM is optional in section 3. If used, it must (a) **show passages generated by the LLM in italicized type** and (b) **ensure the correct use of citations and the validity of the facts and sources**. You are responsible for all content in the report, and using an LLM will not be a defence for inaccurate citing, insufficient citing, or plagiarism.
- **FORMAT** - **Do not include a cover page, table of contents, or other sections not described above**. Instead, present the document in a memo format, **using headings for each section**. See the layout for a memo in the coursepack, page 185. There is no need to include a logo. Address the memo to *Verdad Garcia, head of Canadian operations*. Ignore the p.185 instructions for items below the dividing line. Instead, after the dividing line, begin your report with the executive summary.