**Business report for SEQUACOR Drug planning at MPS Pharmaceuticals**

CB9088 Business Analytics Group 3 Project

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# Executive Summary

This report examines the Sequacor drug launch by MPS Pharmaceuticals.

Its vast potential in demand forecasting, production capacity, and financial viability over two decades are unveiled. Historical data of a previously released drug Propalor guide strategic production planning, while financial insights ensure project resilience. We explore the outsourcing dilemma, emphasising cost-effectiveness and strategic alignment. Our project management framework prioritises precision, outlining timelines, resources, and risk assessments. Tailored strategies forged through meticulous comparative analysis are suggested.

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# Introduction

In the ever-evolving world of pharmaceuticals, MPS Pharmaceuticals stands at a pivotal juncture with the upcoming launch of Sequacor, its newest innovative medication.

This report aims to provide a strategic analysis to guide MPS Pharmaceuticals in making informed decisions regarding production capacity, financial planning, and operational strategies.

At its core lies a meticulously crafted Excel model designed to address various facets of the project. The model integrates historical sales data of a previous drug, market trends, financial considerations, and operational logistics. Key components of the analytical approach include:

* **Demand Forecasting**: Leveraging historical data to predict the 20-year market demand for Sequacor.
* **Optimal Production Capacity**: Determining the production volume that balances efficiency and market demand.
* **Financial Analysis**: Assessing the impact of different discount rates on the project's viability.
* **Outsourcing vs. In-House Production**: Evaluating the strategic options for Sequacor's production.
* **Project Management**: Planning and managing the timeline and resources for establishing a new production facility.

This report is structured to provide a clear and thorough understanding of each analytical component.

# Demand Forecasting

Exponential smoothing was employed to forecast Sequacor's demand, drawing from historical sales data of Propalor. Adjusted for market growth, our model predicts Sequacor's demand over 20 years. Indeed, the forecasted demand for Sequacor mirrors the growth trend observed in Propalor, irrespective of the demand rate percentage. Our analysis explored rates from 5% to 10%, with 7.5% emerging as the most probable trajectory. (See appendix A)

The forecasted sales show a consistent increase year over year. The confidence intervals widen as we project further into the future, which is typical for time series forecasts due to the accumulation of uncertainty. Additionally, external factors and changes in market conditions that might affect the demand for Sequacor are not accounted for in this model.

The surge requires a proactive market entry, while stability requires scalable production. Early marketing and distribution are vital, with long-term strategies emphasising innovation and partnerships. Forecasted demand informs inventory, supply chain, and capacity planning for MPS Pharmaceuticals.

# Optimal Production Capacity

A comprehensive capacity planning model was developed to determine the ideal production capacity for Sequacor, integrating demand forecasts, production costs, and scalability considerations. We aligned anticipated demand with various production scenarios and conducted a thorough financial analysis to assess fixed and variable costs. The optimal production capacity was determined to be 33,201 units annually, striking a balance between meeting demand and avoiding overproduction risks. It's crucial to weigh the costs of maintaining excess capacity if we immediately build to the maximum. A prudent approach often involves starting with a capacity slightly above the projected demand for the initial years, then expanding as necessary. This strategy aligns initial capital outlay with the risk of not meeting demand. Thus, the production facility should initially aim for a capacity that meets, but does not significantly exceed, anticipated demand to avoid the inefficiencies of underused capacity. Ideally, capacity investments should be phased to match demand growth, including a minor surplus to manage unexpected demand spikes.

These findings highlight for MPS Pharmaceuticals key strategies such as synchronising production with demand forecasts, optimising capital utilisation, ensuring supply chain adaptability, and maintaining scalable production capacity for long-term competitiveness.

# Financial Analysis

A crucial aspect for consideration is how varying discount rates impact the financial viability of the Sequacor project. Different discount rates scenarios were explored, primarily 5%, 7.5%, and 10% to understand their effect on the project's net present value (NPV) and internal rate of return (IRR). The net cash flow and NPV were factored to enable a more informed decision. The following describes the findings of each scenario:

* **Lower Discount Rate (5%)**: At this rate, the project showed a higher NPV, suggesting greater long-term profitability. This is because a lower discount rate reduces the cost of capital, making future cash flows more valuable.
* **Moderate Discount Rate (7.5%)**: This provided a balanced view, reflecting moderate risk assumptions. The NPV at this rate was positive, though lower than at 5%, indicating good but more conservative financial viability.
* **Higher Discount Rate (10%)**: At this rate, the NPV was lower, reflecting the increased cost of capital and higher risk. While still positive, the project appeared less attractive financially compared to lower discount rates.

Following the financial analysis, it's prudent to select a moderate discount rate. Thus, balancing risk and reward, a discount rate of 7.5% is suggested for financial planning. This rate offers a practical assessment of the project's profitability and risk exposure.

We have also observed that Profit has no relation with Demand, Selling Price and Costs alone, but with the combination of all these inputs (Appendix B). The impact of variations in demand, unit price and cost on profitability were examined through trial methods and scenario manager analysis. A scenario summary is provided in the excel model.

# Outsourcing vs. In-House Production

In our assessment of Sequacor's production options, we juxtaposed outsourcing against in-house manufacturing. While outsourcing boasts initial cost efficiencies, in-house production promises superior long-term cost management and scalability. Our analysis reveals an NPV of £1.6 millions for in-house manufacturing and £1.3 millions for outsourcing.

The solver function was employed to determine the negotiable cost by modifying the outsourcing cost to align with the in-house production's NPV. It is advised to set the negotiable cost at £2.98 per unit.

Internally manufacturing Sequacor offers advantages in quality control and intellectual property protection, while outsourcing provides flexibility albeit with potential scalability constraints. Long-term considerations encompass:

* **Market Responsiveness**: In-house production facilitates swift adaptation to market dynamics.
* **Investment in Capabilities**: Though requiring significant initial investment, internal capabilities yield enduring benefits.
* **Supply Chain Control**: In-house production ensures robust management of the supply chain.
* **Partnerships and Alliances**: Outsourcing presents opportunities for strategic partnerships that can bring additional expertise and market expansion.

Based on this analysis, we propose a hybrid approach for MPS Pharmaceuticals. Initially, outsourcing can swiftly meet market demands, minimizing upfront investments. Concurrently, investment in internal production capabilities ensures sustained quality control, supply chain management, and aligns with strategic objectives.

# Project Management and Timeline

Establishing a production facility for Sequacor is a significant undertaking requiring meticulous planning and execution. The project involves site selection, design, construction oversight, equipment procurement, staff recruitment, and regulatory approvals to ensure compliance with health, safety, and environmental regulations. Effective project management, risk assessment, and cost control are essential at every stage to achieve timely completion within budget constraints, enabling a safe, efficient, and compliant manufacturing operation.

PERT was used as project management technique to estimate the time for building the new facility and the probability of meeting the 40-week deadline.

Considering our analysis, with a 95% confidence level of meeting the deadline, the anticipated time until the plant can be operational is approximately 227 days, allowing MPS Pharmaceuticals to commence production of Sequacor by month ten of the start date. The probability of completion is 57%.

# Strategic Recommendations

In light of the analysis conducted and the outcome of the calculation presented in the excel model, the following is recommended:

* **Launch of Sequacor**
* **Scalable Production Strategy**: Initially, focus on meeting immediate market demands while preparing to expand production as demand stabilises and grows. The optimal production capacity, aligned with anticipated demand, is 33,201 units.
* **Prioritise Financial Planning and Management:** Implement a moderate discount rate of 7.5% in financial models. Maintain vigilant oversight of financial performance and establish a contingency fund for unforeseen expenses.
* **Phased Production Approach:** Strategically divides increasing production capacity or product launches into stages, enabling gradual scaling in response to market demand, tech advancements, and financial factors, without initial full-capacity commitment.Top of Form Begin by outsourcing to swiftly respond to market demands while minimising initial capital expenditure. Simultaneously, invest in developing in-house production capabilities for enduring strategic advantages.

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* **Maintain Rigorous Project Management:** Adhere to the 10-month timeline for establishing the production facility, proactively managing identified risks. Continuously monitor progress and adapt the project plan as necessary.
* **Future Drug Planning:**
* **Explore Market Expansion and Diversification:** Investigate opportunities to expand Sequacor's market presence, including international markets and potential new indications for the drug.
* **Embrace Continuous Process Improvement:** Allocate resources to research and development to refine production processes, reduce costs, and enhance drug efficacy.
* **Implement Sustainable Practices:** Integrate sustainable and environmentally friendly practices into production processes to align with global standards and bolster corporate social responsibility.
* **Develop a Long-term Financial Strategy:** Regularly review the financial strategy, taking into account market dynamics, competition, and internal performance metrics to ensure sustained viability and profitability.

# Conclusions

The recommendations aim to ensure the success and sustainability of the Sequacor project in a dynamic pharmaceutical landscape. By adhering to these strategic imperatives, MPS Pharmaceuticals can navigate market challenges, capitalise on growth opportunities, and establish Sequacor as a leading pharmaceutical product.

In summary, data input significantly impacts decision-making at every stage of the product launch process, from initial market analysis to post-launch evaluation. By anticipating these factors, leveraging accurate and comprehensive data, MPS Pharmaceuticals can devise contingency plans, adapt strategies in real-time, and mitigate risks, enhancing the likelihood of a successful product launch.

Thus, empowering management to make informed decisions that would enhance Sequacor’s success, optimise resources, and meet consumer needs effectively.

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# Appendices

## Appendix A: Propalor vs Sequacor Demand

## Appendix B: Profit Relation to Demand, Cost and Selling Price alone