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IMA（第十三届）

校园管理会计案例大赛



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Pharmacell 技术投资决策案例

Pharmacell Technology Investment Decision Case

1. 案例背景 Case Background

Pharmacell Inc. (以下简称“PCI”) 是一家专注血液制药行业的专精特新^{注1}民营企业，在该细分市场中排名前列，形成了独特的技术竞争优势。在登陆资本市场之后增长迅速，近五年的收入增长率均超过 20%。虽然处于快速成长中，企业管理层一直关注新产品和新技术对公司影响，希望能够保持可持续增长，从而实现基业长青。

Pharmacell Inc. (hereinafter referred to as “PCI”) is a “specialized, sophisticated, distinctive, and innovative”^{Note1} private company focused on the blood pharmaceutical industry. It ranks among the top in the industry and enjoys a unique technological competitive advantage. Since entering the capital market, it has experienced rapid growth, with annual revenue increasing by 20% in the past five years. Despite its rapid growth, the management have always followed closely the influence of new products and technologies on the Company, aiming to sustain long-term growth and establish PCI as an enduring enterprise.

1.1. 行业特性 Industry Characteristics

我国血液制药行业始于 20 世纪 60 年代，目前发展已经相对成熟。基于血液制品的特殊性和极高安全性要求，国家在总量控制、流通控制、生产质量等方面加大了行业监管，引导行业规范化发展。随着医保广泛覆盖、人口老龄化以及医学临床指南、专家共识等因素影响下，国内血液制品的使用量和临床应用领域持续扩容，血液制品供不应求。

The blood pharmaceutical industry in China dates back to the 1960s and has now evolved into a relatively mature sector. Given the unique characteristics and stringent safety requirements of blood products, the government has intensified its oversight in terms of total production quantity, circulation control, and production quality to foster the standardized development of the industry. Additionally, wide medical insurance coverage, an aging population, requirements to follow medical clinical guidelines, expert consensus have contributed to the continued expansion of blood products utilization and clinical applications in China. Consequently, there is a growing demand for blood products that exceeds the available supply.

白蛋白是血浆中含量最多的蛋白，也是目前国内用量最大的血液制品，广泛用于肿瘤、肝病、糖尿病的治疗；免疫球蛋白指血液中原有的免疫球蛋白和接受特异免疫原刺激产生的特异性免疫球蛋白，多用于免疫性疾病治疗，传染性疾病被动免疫和治疗等；凝血因子在血液中含有最少，凝血因子类产品主要用于凝血、止血。

Albumin is the most abundant protein found in blood plasma and is currently the most widely used blood product in the treatment of tumors, liver diseases, and diabetes; Immunoglobulin, on the other hand, encompasses the naturally occurring immunoglobulin in the blood and the specific immunoglobulin produced as a response to particular immunogen stimuli. It is often used for the treatment of immune diseases, passive immunity, and treatment of infectious diseases, etc.; Coagulation factors, which have the lowest content in the blood, are mainly used for coagulation and hemostasis.

注1：“专精特新”即“专业化、精细化、特色化、新颖化”，是指主营业务突出、专业能力强、研发创新能力强、具有发展潜力的中小企业，主要集中在新一代信息技术、高端装备制造、新能源、新材料、生物医药等中高端产业。

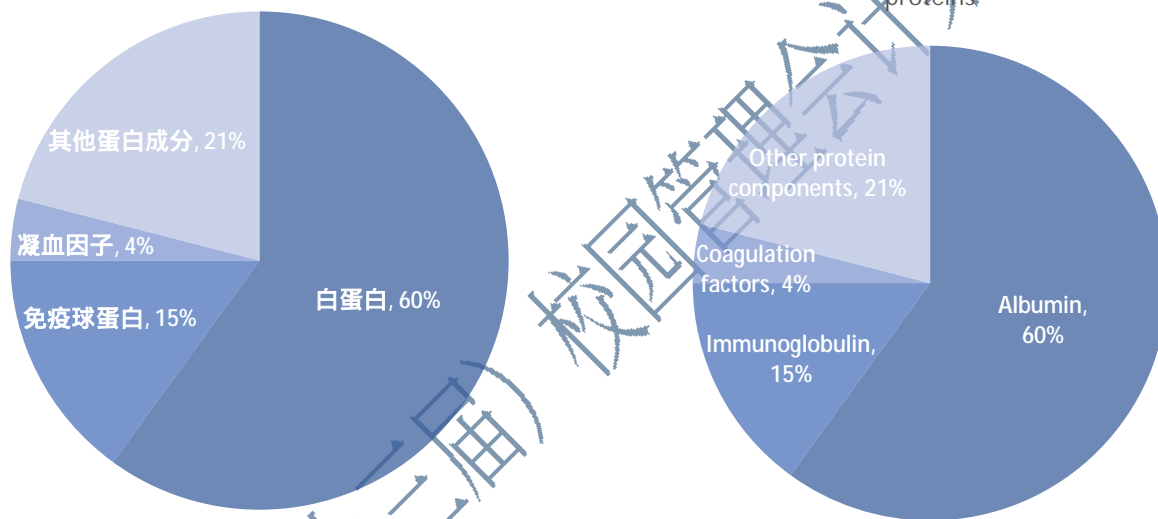
Note1: “Specialized, sophisticated, distinctive, and innovative” refers to small and medium-sized enterprises with outstanding main business, strong professional capabilities, R&D and innovation capabilities, and development potential, mainly concentrated in the new generation of information technology, high-end equipment manufacturing, new energy, new materials, biopharmaceuticals and other high-end industries.

血液制品有其行业特殊性，其生产原材料为人类血浆，必须通过国家审批的采浆站进行采集，无法通过其他方式合成。所以，原材料（血浆）供应是制约行业及企业发展的瓶颈。据统计，2021 年我国公立医疗机构市场中血液制品销售额为 430 亿元，国内原料血浆需求量已超 16,000 吨/年，而 2022 年国内单采血浆站共采集血浆约 10181 吨，国内原料血浆供应量及其增速已无法满足持续旺盛的市场需求。

Blood products possess unique characteristics within the industry. Their raw material is human plasma, a substance that can only be collected through state-approved plasma collection stations and cannot be artificially synthesized. Therefore, the availability of plasma stands as a bottleneck that constrains the development of the industry and individual enterprises. According to statistics, the sales volume of blood products for public medical institutions in China in 2021 reached 43 billion yuan, and the domestic demand for raw plasma exceeded 16,000 tons/year. However, in 2022, plasma collection stations in China were only able to collect a total of 10,181 tons of plasma. The domestic supply of raw plasma and its growth are insufficient to meet the sustained strong market demand.

图1：血浆蛋白组成成分及占比

Figure 1: Composition and proportion of plasma proteins



单采血浆站是指仅采集献血者血浆部分的血站，按照国家卫生部有关标准和要求并经严格审批设立，是行业原材料（血浆）的唯一来源。单站采浆量一般 30 吨/年左右，由于血浆检疫期要求，血浆制品的生产周期平均为 100 天。单采血浆站通常利用全自动单采血浆机分离出献血者血液中的血浆部分，将血细胞输回献血者，使其更快恢复体力，更有利于捐献者的健康，因此必须受到严格监管。过去 5 年，我国浆站审批严格，新批浆站数量少；十四五规划期间，审批浆站数量有望增加。

Apheresis Plasma Stations (Plasma collection station), established in strict accordance with relevant standards and requirements of the Ministry of Health, are facilities that only collect plasma from blood donors, and are the sole source of the raw material (plasma) in the industry. Typically, the amount of plasma collected at an individual station is around 30 tons per year. Due to the requirements related to the quarantine period for plasma, the average lead time of plasma products is 100 days. Apheresis Plasma Stations usually employ fully automatic plasma collection machines to extract plasma from donors' blood while returning the blood cells to the donors. This process enables the donors to recover faster and is more beneficial to their health. Therefore, these stations must be strictly regulated. Over the past five years, the approval of plasma collection stations in China has been stringent, with a limited number of newly approved stations; During the 14th Five Year Plan period, the number of approved stations is expected to increase.

1.2. 企业和产品 PCI and Its Products

目前, PCI 现有 9 条产品线, 涵盖白蛋白 (ALB)、免疫球蛋白 (IG) 和凝血因子 (CF) 三大类 9 个品种 23 个规格。血浆产品属于同一原材料下的联产品^{注2}, 产品线越多, 每类血液制品产品分摊的血浆成本就越低, 产品竞争力就越强, PCI 公司依据各产品的产值来确定各产品分摊血浆成本的比例。

Currently, PCI operates with nine product lines, including nine varieties and 23 specifications of albumin (ALB), immunoglobulin (IG), and coagulation factor (CF) across three major categories. Plasma products are co-products^{Note2} sourced from plasma. The greater the number of product lines, the lower the plasma cost allocated to each type of blood product, and thus the stronger the product competitiveness. PCI determines the allocation of plasma cost for each product based on the respective output value.

图2：PCI公司营业收入趋势图 单位：万元

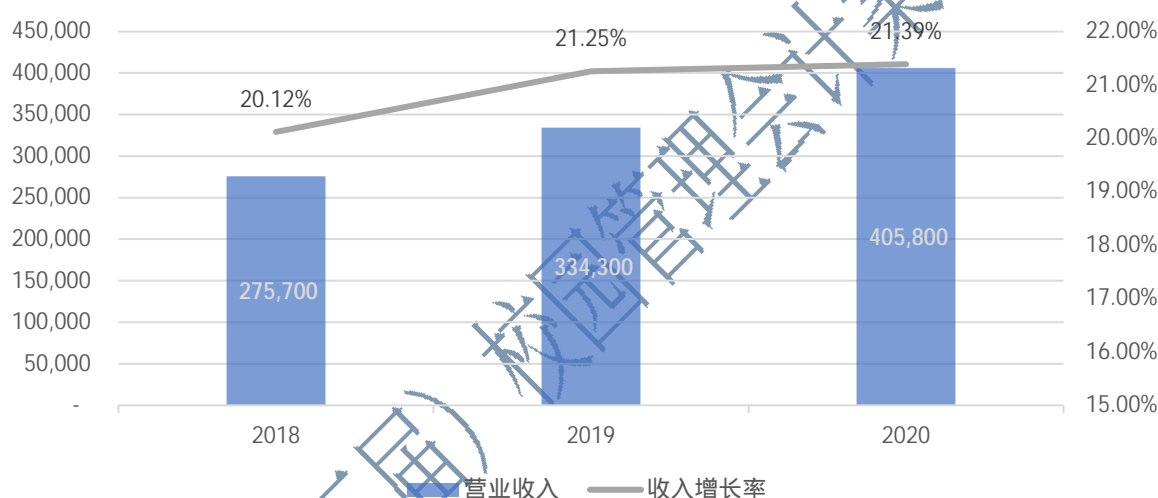
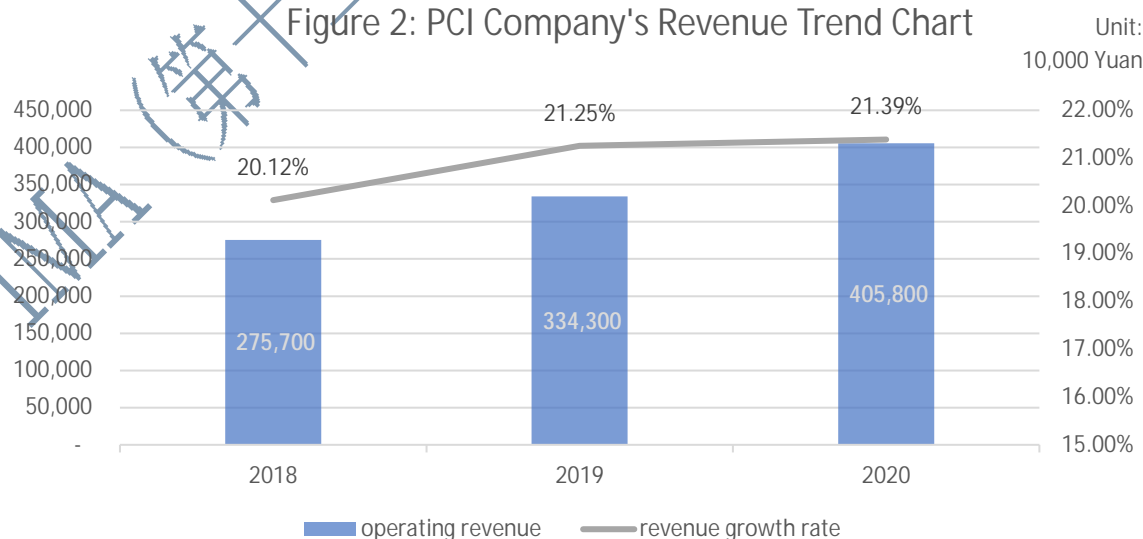


Figure 2: PCI Company's Revenue Trend Chart



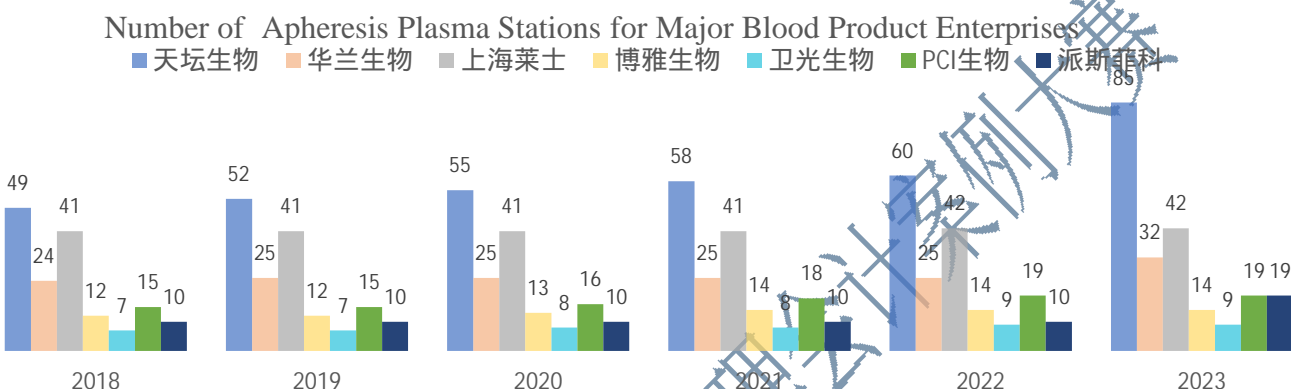
注2：“联产品”是用同一种原材料，通过同一个生产过程，生产出的两种或两种以上经济价值较大的主要产品。

Note2: "co-products" refers to two or more major products with significant economic value produced through the same production process using the same raw material.

在供给端，由于原材料对生产的瓶颈效应，PCI 公司正在积极扩大采浆规模，以期保证后期可持续的增长。截止 2021 年末，PCI 公司已有 18 家单采血浆站并正常运营，2022 年 9 月，新增 1 家单采血浆站验收完毕已投入使用。

On the supply side, due to the bottleneck effect of plasma on production, PCI is actively expanding the scale of plasma collection to ensure sustainable growth in the future. As of the end of 2021, PCI successfully operated 18 Apheresis Plasma Stations. In September 2022, a new Apheresis Plasma Station was formally accepted and commenced operations.

图3：主要血液制品企业单采血浆站数量



1.3. 管理架构 Management Structure

PCI 公司采用董事会管控下的总经理负责制，各责任中心根据责任范围进行考核，总部作为投资中心，主要财务考核指标为投资收益率（ROI）、净资产收益率（ROE）等；按三大类产品划分的三大事业部均按照利润中心^{注3}进行管理，主要财务考核指标为事业部营业利润率、总资产周转率等；总部作为生产基地对各血浆站 100%控股，血浆站作为成本中心由总部原料拓管部统一管理，财务考核指标为采血量、单位采血成本，成本中心的业绩报告采用自下而上，从最基层的成本中心逐级向上汇编，直至原料拓管部；市场营销部作为收入中心进行管理，主要财务考核指标为收入增长率、应收账款周转率等，其他部门作为费用中心进行管理，主要通过费用预算完成率来进行考核。

PCI adopts a general manager responsibility system under the oversight of the Board of Directors, with each responsibility center being evaluated based on their scope of responsibility. The headquarter functions as an investment center, with key financial performance indicators including return on investment (ROI) and return on equity (ROE), etc.; The three major business units divided by three major product categories are managed as profit centers^{Note3}, and their key financial performance indicators are the operating profit margin and the total asset turnover rate; The headquarter, serving as the production base, maintains 100% control over each plasma station. The plasma station, categorized as the cost center, is under unified management by the Raw Material Department at the headquarter. The key financial indicators for these stations include blood collection volume and collection cost per unit of blood. The performance reports for the cost centers are generated from bottom to top, starting from the most basic-level cost centers to the Raw Material Department; The Marketing Department is managed as a revenue center, with its main financial evaluation indicators being revenue growth rate and accounts receivable turnover rate; and the remaining departments serve as expense centers are primarily evaluated based on the achievement of expense budgets.

注3：“利润中心”是指对成本承担责任，又对收入和利润承担责任的企业所属单位，是对利润负责的责任中心。

Note3: “Profit center” refers to the unit of an enterprise that is responsible for both costs and revenue and profits. It is the responsibility center responsible for profits.

由于公司近几年业务增长迅速,企业规模不断扩大,为加强集团财务管控,PCI公司于2022年初在总部新设管理会计部(以下简称“管会部”),向总经理 David 直接汇报,Succi 担任管会部负责人,负责组织并推动集团全面预算、各责任中心经营分析、成本管控、产品定价策略等工作,同时在下属的三大事业部(ALB、IG、CF)分别派驻事业部财务BP,实行矩阵管理,协助事业部预算管理、经营分析、成本管控。鉴于PCI公司产品在市场上供不应求,全面预算采用产供销联动机制,以产定销、全产全销的业务模式。

With the rapid business growth, these years PCI's scale continues to expand. The Company established a Management Accounting Department in early 2022, reporting directly to General Manager David, to enhance the financial control within PCI. Succi serves as the head of this department, responsible for organizing and facilitating various aspects, such as the comprehensive budgeting, business analysis of each responsibility center, cost control, product pricing strategy, etc.; dispatching financial BPs to the three subordinate business units (ALB, IG, CF) to implement a matrix management approach by assisting in budget management, business analysis, and cost control for each respective unit. Given the strong market demand for PCI's products that exceeds its supply, the comprehensive budgeting process adopts a linkage mechanism among production, supply, and sales, with a business model of determining sales volume by production, i.e., all production volume corresponds to all sales volume.

图 4：PCI 公司组织架构图

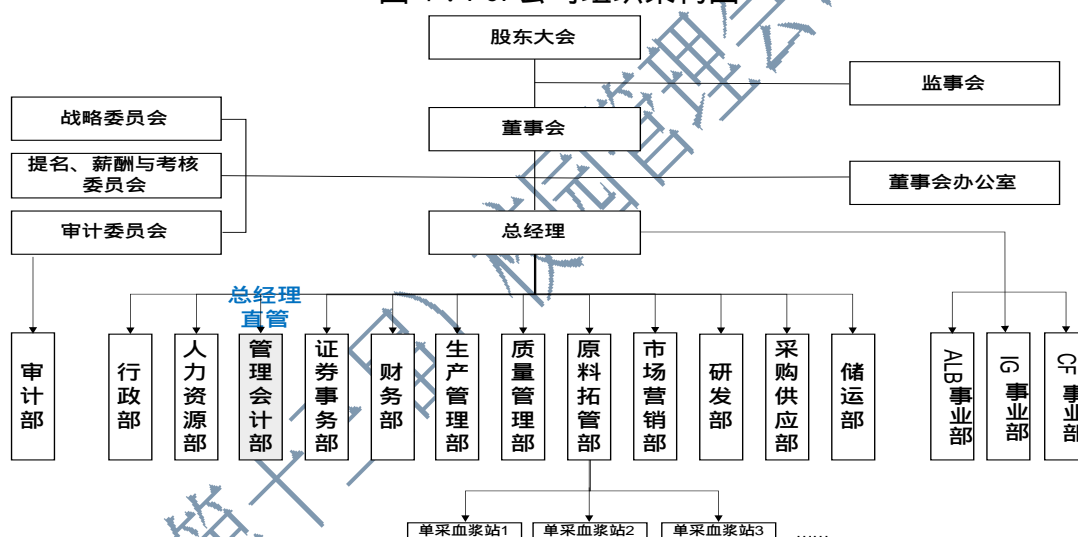
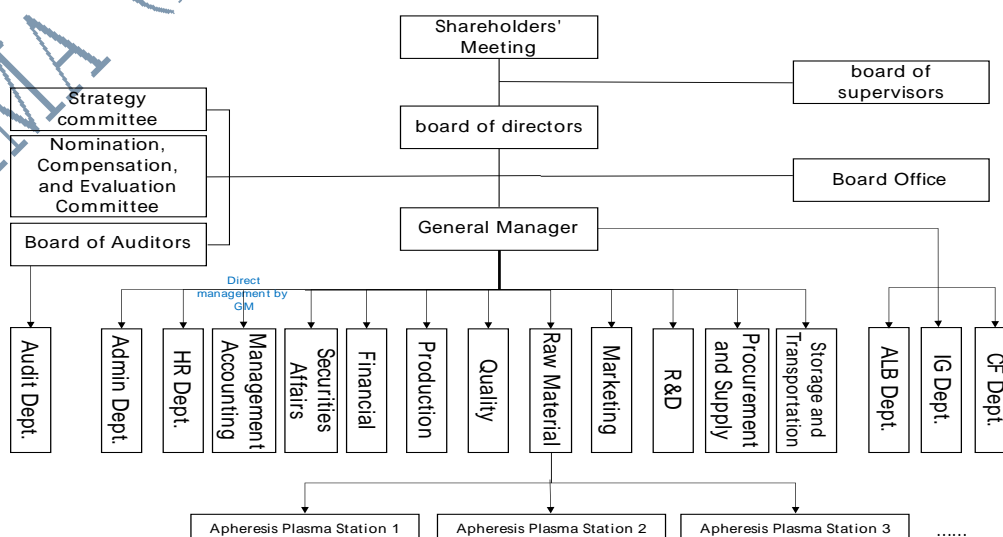


Figure 4: PCI Company Organizational Chart



2. 案例：技术投资分析复盘 Case: Technical Investment Analysis Review

2023 年 7 月，PCI 公司各项经营数据按时出炉。其中，ALB 事业部未能达成 2023 年度上半年财务考核指标。管理层高度重视，以此为专题召开了 2023 年度上半年经营分析会。

In July 2023, PCI released all its business data on schedule. The ALB business unit did not meet its financial assessment targets for the first half of 2023. The Company's management attached great importance to this and organized a special business analysis meeting for the first half of 2023.

2.1. 管理层的分歧 Management Disagreements

经营分析会准时召开，David、集团主要经营管理层、ALB 事业部负责人 Jack、Succi 等列席会议。会议开始，Jack 用 10 分钟展示了 2023 年度上半年经营分析报告，报告显示 ALB 事业部上半年营业利润率低于目标 8%，总资产周转率低于目标 10%。

The business analysis meeting was held as scheduled, with the participation of David, the key management team of the company, Jack, the head of ALB business unit, and Succi. At the beginning of the meeting, Jack presented a 10-minute business analysis report for the first half of 2023. The report showed that the ALB business unit had fallen short of its first-half operating profit margin target by 8% and its total asset turnover rate target by 10%.

Jack 打开了一张利润预实对比图^{注4}，指着最上面的收入指标说道：“今年 1 月 ALB 产线高技术产业化推进项目（简称 ALB 项目）完工正式投产，投产后预计原材料的年产能可增加 30 吨血浆，但由于上半年实际血浆供应不足，使得总产能利用率只达到 62%，大大低于预算假设前提 70% 的产能利用率，造成收入低于预期 8%；此外，由于新产线投产转固折旧费用过高，造成生产成本增加”。

Jack opened a budget-actuals comparison chart^{Note4} and pointed to the top revenue indicator, saying: “In this January, we completed and officially launched the High-tech Industrialization Promotion Project of ALB Production Line (hereinafter referred to as “ALB Project”). Following its launch, we anticipated an annual increase of plasma production capacity by 30 tons. However, due to insufficient plasma supply in the first half of this year, the total capacity utilization rate only reached 62%, significantly lower than the budgeted assumption of a 70% capacity utilization rate. This resulted in an 8% revenue shortfall compared to our expectations. In addition, the high depreciation cost of the new production line led to increased production cost.”

说到这里，Jack 停顿了一下，提出了质疑：“我认为 ALB 事业部上半年财务绩效指标没有完成，主要受原材料供应不足影响，如果不能尽快提高血浆供应量，下半年经营效益也会受影响，请原料扩展部给出合理解释并给出下半年供应计划。”

Jack paused for a moment and questioned, “I believe that the financial performance indicators of the ALB business unit in the first half of the year were not met, primarily due to inadequate plasma supply. If we can't increase plasma supply promptly, it will also impact on our operational efficiency in the second half of the year. I request the Raw Material Department to provide a reasonable explanation and present a supply plan for the second half of the year.”

注 4：“预实对比图”——预算和实际情况对比图

Note4: “Budget-actuals comparison chart” – Comparison chart between budget and actuals

听完了 Jack 的汇报，原料扩展部负责人 Tim 站起来解释道：“由于新单采血浆站是去年 9 月才投入使用，虽然预计采浆量 30 吨/年左右，但是新建单采血浆站血浆供应量存在爬坡过程，一般 2-3 年后才能稳定在 30 吨/年，第一年采浆量只能达到 60%左右。”

After hearing Jack's report, Tim, the head of the Raw Material Department, stood up and explained that "The new Apheresis Plasma Station was only put into operation last September. While the estimated plasma collection volume is about 30 tons per year, there is a ramp-up process for the plasma supply from the new Apheresis Plasma Station. Typically, it takes 2-3 years to stabilize at 30 tons per year. In the first year, the plasma collection volume can only reach about 60%."

Succi 听说后补充道：“公司年度经营预算是参照总部提供的项目决策依据年产能 30 吨编制，现在看来当时的投资决策依据过于简单，只考虑了投产后正常年份的平均产能利用率，没有考虑血浆供应量爬坡对产能的影响”。

After hearing this, Succi added, "The company's annual operating budget was based on the decision-making criteria set by the headquarter, assuming an annual production capacity of 30 tons. It seems that the criteria were too simplistic. We only considered the average production capacity utilization rate in typical years after production, without considering the impact of the ramp-up in plasma supply on production capacity."

Jack 听说后立即对 ALB 事业部 2023 年度预算目标提出质疑，希望调整 ALB 事业部的 2023 年度财务绩效指标。David 抬手打断了 Jack 的讲话：“ALB 事业部的经营分析，暴露了我们对内部技术投资项目的评价存在问题，且与年度预算脱节，我们的内部技术投资项目评价方法是否科学？我们的预算编制依据是否可靠？会后请管会部以“ALB 产线高技术产业化推进项目”为调研对象，梳理公司内部技术投资项目评价机制并提出改善建议，同时就如何协调内部技术投资项目预算和年度全面预算给出合理化建议。”

Following Succi's comments, Jack immediately raised doubts about 2023 budget goals for the ALB Business Unit and hoped to adjust ALB's 2023 financial performance indicators. David interrupted Jack and said: "The business analysis of the ALB business unit has exposed our problematic evaluation of internal technology investments, and it also deviated from our annual budget. Is our evaluation method for internal technology investments makes sense? Can we rely on our basis for budgeting? I request the Management Accounting Department to conduct research on the "ALB Project" to review the evaluation mechanism for internal technology investments and propose well-informed recommendations for improvement. Additionally, I hope to receive recommendations on how to align budgeting for internal technology investments with annual comprehensive budgeting."

2.2. 技术投资管理的现状 Current Situation of Technology Investment Management

管会部调研了 PCI 公司内部技术投资项目评价工作，内容如下：

The Management Accounting Department conducted research on the evaluation process of the Company's internal technology investment, and the outline of this research is as follows:

图 5：内部技术投资项目评价流程

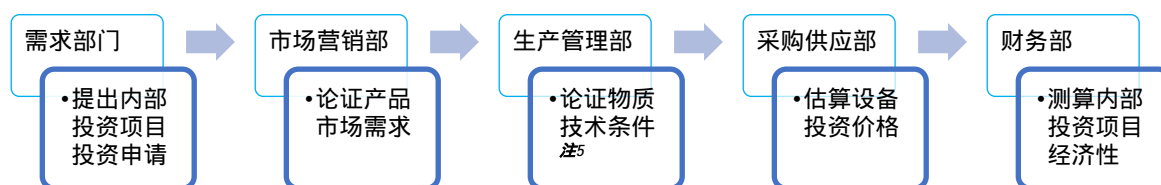
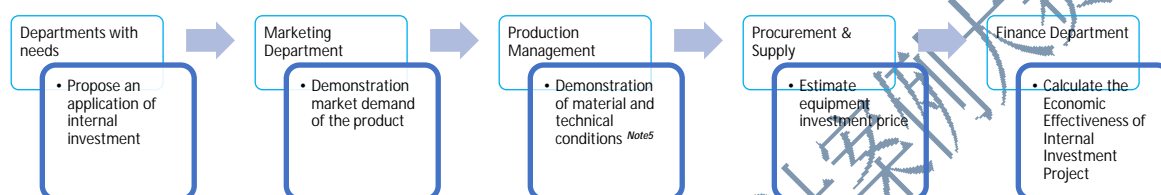


Figure 5: the Evaluation Process of Internal Technology Investment



其中财务部测算内部技术投资项目经济性指标主要有 2 个：

The Finance Department uses two key indicators to measure the performance of the Company's internal technology investment:

- 1) 投资收益率 (ROI)：表示项目投资的盈利水平，是内部技术投资项目达到设计能力后正常年份的年息税前利润 (EBIT) 与项目总投资 (TI) 的比率，其计算公式为： $ROI = EBIT \times 100\% \div TI$ 。PCI 公司目前要求内部技术投资项目的投资收益率不低于 20% (含)；

Return on Investment (ROI): a metric that measures the profitability of a project investment. It is calculated as the ratio of Earnings Before Interest and Tax (EBIT) of an internal technology investment project, after it has reached its design capacity in a typical year, to the Total Investment (TI) of the project. The formula for calculating $ROI = EBIT / TI \times 100\%$. PCI requires that its internal technology investment projects must have an ROI of at least 20% or higher.

- 2) 投资回收期：表示项目从投产后所获得的收益抵偿全部投资所需要的时间，自内部技术投资项目投产之年起，用总投资额除以正常年份的年净现金流量的值来表示，其计算公式为：投资回收期 = $TI \div [EBIT \times (1 - \text{所得税率}) + \text{年折旧}]$ ，PCI 公司目前要求最多 5 年 (含) 收回投资。

Investment Payback Period: a metric that measures the time it takes for a project to recover all its investments with the profits generated after production. For an internal technology investment project, the payback period begins when the project is operational and is calculated by dividing the total investment amount by the annual net cash flow in a typical year. The formula for calculating the Investment Payback Period = $TI / [EBIT \times (1 - \text{Income tax rate}) + \text{annual depreciation}]$. PCI requires that an investment payback period must not exceed 5 years.

注 5：“物质技术条件”，包括场地、技术、设备、器材、原材料、未公开的技术信息和资料等。

Notes: "Material and technical conditions" include site, technology, equipment, equipment, raw materials, undisclosed technical information and materials, etc.

ALB 产线高技术产业化推进项目 (ALB 项目) 于 2022 年 5 月立项, 属于扩张性投资^{注6}项目, 该项目预计总投资 700 万元 (主要为机器设备购置费, 含设备安装调试费), 按单采血浆站年采血浆量 30 吨测算, 正常年份的投资收益率大于 30%, 投资回收期小于 3 年, 符合公司对内投资要求, 该项目投资资金自筹, 2023 年 1 月已通过验收并正常投入使用。

The “High-tech Industrialization Promotion Project of ALB Production Line” (ALB Project) was approved in May 2022 as an expansion investment^{Note6} initiative. The estimated total investment for the project was 7 million yuan (mainly for machinery and equipment procurement, including equipment installation and debugging costs. With an annual collection volume of 30 tons blood plasma from each individual plasma collection station, the project’s investment return rate in typical years exceeds 30%, and the investment payback period is under 3 years, aligning with the Company’s internal investment criteria. The self-funded project passed the acceptance and commenced operations in January 2023.

2.3. 技术投资管理的优化 Optimization of Technology Investment Management

为了更好的建成内部技术投资项目评价机制等工作, David 聘请了你所在的管理会计咨询团队为管会部提供投资项目财务管理咨询。咨询团队先对公司经营管理层和财务部、管会部进行了有关长期投资课程的培训, 咨询专家通过比较投资项目的各项财务评价指标, 让大家认识到评价长期投资项目的盈利水平需要考虑资金的时间价值, 也认识到内部技术投资项目全生命期预算的重要性。

To develop a better evaluation mechanism for the Company’s internal technology investments, David has engaged your management accounting consulting team to provide the Management Accounting Department with financial management consulting for investment projects. The consulting team conducted a training session on long-term investments for the Company’s executive team, Finance Department, and Management Accounting Department. During the training session, consulting experts compared various financial evaluation indicators for investment projects to help participants understand the importance of considering the time value of money when assessing the profitability of long-term investment projects, and the importance of implementing full lifecycle budgeting for internal technology investment projects.

咨询团队认为, 现有内部技术投资项目评价方法过于粗放, 经过多方论证, 协助 Succi 拟定了以下内部技术投资项目评价机制:

The consulting team believes that the existing evaluation methods for internal technology investments are too extensive. After extensive discussions, they assisted Succi in formulating the following evaluation mechanism for internal technology investment projects:

注 6: “扩张性投资”即企业为了扩张业务而购置新资产。比如扩大生产规模, 或增加新的产品生产和经营项目, 其核心是发展和壮大。

Note6: “Expansion investment” refers to the acquisition of new assets by a company in order to expand its business, e.g., expanding production scale or adding new product production and business projects. The core objective is to achieve development and growth.

图 6：内部技术投资项目评价机制

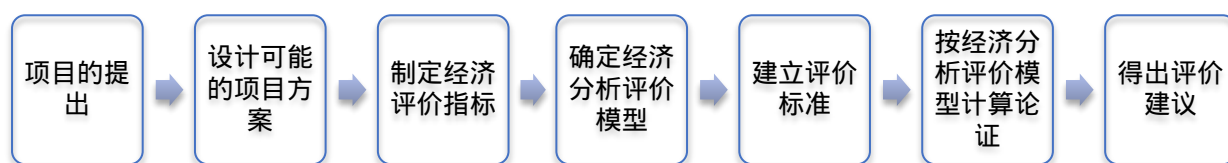


Figure 6: Evaluation Mechanism for Internal Technology Investment Projects



同时协助 Succì 拟定了以下建立经济分析评价模型流程：

Meanwhile, the team assisted Succì in developing the following process for establishing an financial analysis and evaluation model:

- 1) 制定内部技术投资项目基础数据表，包括资本支出情况、销售情况、成本构成、税率及资本成本率等，包括各部门按要求所提供预测数据；
Create a fundamental data sheet for internal technology investment projects, including capital expenditure, sales, cost breakdown, tax rates, and capital cost rates as well as forecasts provided by each department as required.
- 2) 按时间维度编制全项目周期的项目预计利润表（只预测项目投资产生的增量利润）；
Prepare a projected profit statement for the entire project cycle based on different time periods (only forecasting incremental profits generated by investment projects).
- 3) 按时间维度编制全项目周期的项目预计现金流量表，确定每期期末净现金流量；
Prepare a projected cash flow statement for the entire project cycle based on different time periods and calculate the net cash flow at the end of each period.
- 4) 根据公司要求的必要报酬率计算净现金流量的现值；
Calculate the present value of net cash flow based on the Company's required rate of return.
- 5) 计算各项评价指标。
Calculate each evaluation indicator.

两周后,管会部在咨询团队的帮助下初步建立了投资项目调研模板,分不同部门对 ALB 产线高技术产业化推进项目投资预测基础数据进行了细致的调研并收集了有关 ALB 产线高技术产业化推进项目测算基础数据(为简化计算,所有收支均不考虑账期影响):

Two weeks later, with the help of the consulting team, the Management Accounting Department initially created a research template for investment projects. Detailed research was conducted on the basic data related to the investment forecasts for the ALB project, and relevant data for assessing the project were also collected (for the sake of simplicity, all income and expenses do not consider the impact of accounting periods):

· 资本支出预算:

项目资本支出主要包括设备:反应罐、离心机、超声波清洗器、灭菌机、过滤器、分装机等,整个产线最大设计产能按原料血浆生产能力为 75 吨/年,经过与长期合作供应商书面确认,设备投资含税总额为 700 万元(含安装调试费用),设备预计可使用年限 10 年,最终处置后可收回 7 万元(不考虑收回增值税),设备投资总额在调试完毕后一次性支付;公司财务制度规定,固定资产折旧会计政策采用直线法,残值率为 5%,生产设备折旧年限 10 年。该产线投入生产时需一次性投入营运资金 20 万元,待项目结束时收回。

Capital expenditure budget:

The project's capital expenditure mainly includes equipment, such as reaction tanks, centrifuges, ultrasonic washers, sterilization machines, filters, and packaging machines. The entire production line has a maximum designed plasma production capacity of 75 tons per year. After obtaining written confirmation from long-term suppliers, the total investment in the equipment (including tax) is 7 million yuan (which includes installation and debugging costs), and the expected service life of the equipment is 10 years. A total of 70,000 yuan can be recovered after final disposal (without considering the recovery of value-added tax), and the total investment in the equipment will be paid in a lump sum after the completion of debugging; The Company's financial policies state that the accounting policy for depreciation of fixed assets follows the straight-line method, with a residual value rate of 5% and a depreciation period of 10 years for production equipment. When the production line is put into production, a one-time investment of 200,000 yuan in operating capital is required, which will be recovered at the end of the project.

· 销售预测:

销售部认为,未来十年国内白蛋白产品将继续保持市场供不应求状态,白蛋白产品可以采用以产定销模式,由于血浆原料获取和生产过程受国家严格管控,预计产能达标后产量受原材料供应量影响。依据新设备生产能力,每吨血浆可以灌装白蛋白产品 2000 瓶,每瓶含税售价 320 元(平均售价,预计未来市场价格波动率较小,不同年份的价格差异可以忽略不计)。

Sales forecast:

The Sales Department believes that the domestic market for albumin products will continue to experience a situation where demand exceeds supply in the next decade. Albumin products can follow a production-to-sales model, meaning that the sales volume will be determined based on the production volume. However, due to strict national regulations governing the acquisition and production process of plasma, it is expected that the production capacity will be constrained by the supply of plasma once it reaches the production capability standard. Based on the production capacity of the new equipment, 2,000 bottles of albumin products can be filled per ton of plasma, with a tax-inclusive price of 320 yuan per bottle (average selling price). Price volatility in the market is expected to be minimal in the future, and price differences between different years can be disregarded).

· 血浆原料供应量预测：

根据以往经验，单采血浆站血浆供应量一般为每年 30 吨左右，新建单采血浆站血浆供应量存在爬坡过程，根据公司其他单采血浆站供血量历史数据，以及新建单采血浆站所在地人口数据分析预测：第一年采浆量为 18.75 吨，第二年采浆量为 22.50 吨，第三年后采浆量可以稳定在 30 吨左右。

Prediction of plasma supply:

Based on past experience, the plasma supply from an Apheresis Plasma Station is typically around 30 tons per year. There is a gradual ramp-up process in the plasma supply from the new Apheresis Plasma Station. Based on historical data of blood supply from other Apheresis Plasma Stations of the Company and demographical analysis of the place where the new Apheresis Plasma Station is located, it is predicted that the plasma collection volume in the first year will be 18.75 tons, and in the second year, it will increase to 22.50 tons. After the third year, the plasma collection volume will stabilize at around 30 tons.

· 销售成本预测：

白蛋白生产成本按照成本性态分为变动成本和固定成本，各项含税成本预测如下：

Sales cost prediction:

The production cost of albumin is divided into variable cost and fixed cost based on cost characteristics. The cost predications (with tax included) are as follows:

2 变动成本包括：Variable costs include:

- (1) 直接材料：每吨血浆年成本 50 万元，公司按各事业部产品产值占比分摊原料血浆成本，白蛋白事业部分摊血浆成本率为 60%；其他辅助耗材每吨血浆年耗用 6 万元。

Direct materials: The annual cost of each ton of plasma is 500,000 yuan. The Company allocates the cost of plasma based on the proportion of product output value of each business unit, and the cost allocation rate for plasma in the Albumin Department is 60%; Other auxiliary consumables cost 60,000 yuan per ton of plasma annually.

- (2) 能源耗用：每吨血浆生产预计年耗用水电气等能源费用 5 万元。

Energy consumption: The estimated annual cost of water, electricity, and other energy consumption per ton of plasma production is 50,000 yuan.

- (3) 销售费用：指随产销量变动的销售费用，含运输费、销售人员提成等，预计占不含税销售额 5%。

Sales expenses: sales expenses that vary with production and sales, including transportation costs, sales personnel commissions, etc. Sales expenses are expected to account for 5% of sales volume, excluding taxes.

- (4) 维修保养费用：设备有一年质保期，第一年无维护保养费。由于以往年度未区分维修和保养费用，生产管理部只能按经验数据粗略预测未来十年每年维护保养费占生产线投资成本的比率：

Maintenance costs: During the first year when the equipment is under a one-year warranty, there will be no maintenance fee. Due to the lack of distinction between repair and maintenance costs in previous years, Production Department can only provide a rough estimate of the annual maintenance costs as a percentage of the production line investment for the next decade using empirical data:

使用年数 Years of Use	维修保养费占比 Ratio of repair and maintenance costs	使用年数 Years of Use	维修保养费占比 Ratio of repair and maintenance costs
第 1 年/1 st Y.	—	第 6 年/6 th Y.	1.5%
第 2 年/2 nd Y.	1%	第 7 年/7 th Y.	1.8%
第 3 年/3 rd Y.	1%	第 8 年/8 th Y.	1.8%
第 4 年/4 th Y.	1%	第 9 年/9 th Y.	2%
第 5 年/5 th Y.	1.5%	第 10 年/10 th Y.	2.50%

2 固定成本包括 : Fixed costs include:

- (1) 人工成本 : 含工资、奖金、社保、公积金、福利费等直接人工费用, 预计投产后第一年人均人工成本为 12 万元/年, 以后每年以 5% 的比例递增。设备需额外增加生产作业人员 15 人。

Labor costs: including direct labor costs, such as wages, bonuses, social security, housing accumulation funds, and welfare expenses. It is expected that the per capita labor costs will be 120,000 yuan per year in the first year after the equipment is put into operation and will increase by 5% annually thereafter. The equipment requires an additional 15 operation personnel.

- (2) 新增产线投入不需增加管理人员, 为便于核算新产线产品成本, 财务部预计将 ALB 事业部已有管理费用分摊入新产线, 分摊明细如下: 管理费用及固定销售费用 15 万元/年、研发费用 8 万元/年、财务费用 3 万元/年。

The new production line does not require additional management personnel. To simplify the calculation of product costs for the new production line, the Finance Department intends to allocate the existing management expenses of the ALB Department to the new production line. The allocation details are as follows: management expenses and fixed sales expenses of 150,000 yuan per year; research and development expenses of 80,000 yuan per year, and financial expenses of 30,000 yuan per year.

- 公司税收政策: 增值税采用简易征收模式, 采用 3% 的征收率, 城建及教育费附加为应交增值税的 12%, 公司于 2023 年刚通过高新技术企业复审, Succi 与董事会办公室确认了公司要求的投资必要报酬率为 14%。

Company tax policy: The value-added tax follows a simple collection model with a 3% collection rate, and the urban construction and education surcharges are 12% of the payable value-added tax. The Company has recently passed the high-tech enterprise status review in 2023, and Succi has confirmed with the Board of Directors' office that the Company's required rate of return on investment is 14%.

3. 案例问题：Case Question:

问题 1：

根据新拟定的内部投资项目评价机制，需要选定经济评价指标，请您列举影响内部投资项目决策的经济评价指标有哪些？分析各指标优缺点，并代入 PCI 公司现有经济评价指标进行点评。帮助管会部搭建适合 PCI 公司不同类型内部投资项目场景的经济评价指标。

Question 1:

Under the newly developed internal investment project evaluation mechanism, it is required to select financial evaluation indicators. Could you please elaborate the financial evaluation indicators that affect the decision-making for internal investment projects? Analyze the advantages and disadvantages of each indicator and incorporate it into PCI's existing financial evaluation indicators for evaluation. Assist the Management Accounting Department in devising financial evaluation indicators tailored to various types of internal investment project scenarios at PCI.

问题 2：

请您帮助 Succi 根据新拟定的建模流程设计扩张性投资项目经济评价模型，并将管会部调研的 ALB 产线高技术产业化推进项目测算基础数据代入经济评价模型，计算新选定的经济评价指标（至少 2 个指标），制作 PPT 向公司经营管理层汇报，并就如何协调投资项目预算和年度全面预算给出合理化建议。

Question 2:

Please help Succi design a financial evaluation model for expansion investment projects based on the newly developed modeling process, and incorporate the basic data related to the ALB Project collected by the Management Accounting Department into the financial evaluation model. Calculate the newly selected financial evaluation indicators (at least two indicators), prepare a PowerPoint presentation to report to the Company's management. Lastly, provide well-reasoned recommendations on how to align investment project budgeting with the annual comprehensive budgeting.

- 结束 -
- End -