IMA（第十三届）校园管理会计案例大赛
区域决赛案例

技术投资项目决策
Technology Investment Project Decision-making

（案例背景延续前期校内赛/区域赛案例情节）

1. 面对新挑战的抉择 Decision making for new challenges

一个月后，Succi 代表管会部向公司经营管理层汇报了有关内部投资项目评价机制、经济评价指标、模型的改善建议，并展示了 ALB 产线高技术产业化推进项目代入模型重新计算的经济评价指标结果，通过新旧指标结果的对比，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，也理解了内部投资项目预算和年度预算的关系。这场汇报得到了公司经营管理层一致认可，会议通过了新的内部投资项目评价机制，同时根据总体战略要求和过往投资项目表现，确立了公司内部投资项目评价标准：即动态回收期＜5 年，净现值为正，内含报酬率＞14%。

One month later, Succi, on behalf of the management accounting department, reported to PCI management team on improvement suggestions for internal investment project evaluation mechanism, financial evaluation indicators, and model. She also presented the financial evaluation indicators results recalculated by substituting ALB project into the model. From the result comparison of new and old indicators, everyone realized that evaluating the profitability of long-term investment projects requires the consideration of the time value of funds and they also started to understand the relationship between internal investment project budget and annual budget. Everyone on the management team unanimously agreed with this report. The new internal investment project evaluation mechanism was approved. Based on overall strategic requirements and past investment project performance, PCI established its evaluation criteria for internal investment project: dynamic payback period<5 years, positive net present value, and internal rate of return（IRR）>14%.

与此同时，PCI 公司认识到全球制造业正受到自动化、智能化大潮的冲击，通过智能制造部署能够显著提高企业财务效益。PCI 公司研发部近几年也在积极摸索自动化、智能化改造的方向。2022 年下半年公司研发部考察了多家行业先进生产设备供应商，希望通过生产车间智能化改造提高生产效率、稳定产品质量。经过充分调研，PCI 公司计划以实现生产精益化、自动化、智能化为目标，率先在 IG 事业部 T1 产线进行智能化生产设备更新改造试点，更新改造后产量不变，直接材料成本不变，人工成本大幅降低。

Meanwhile, PCI recognized that the global manufacturing industry is being impacted by a wave of automation and intelligence, and deploying intelligent manufacturing can significantly improve financial benefits. The R&D department had been actively exploring the direction of automation and intelligence transformation in recent years. In the second half of 2022, the R&D department inspected many advanced production equipment suppliers, hoping to increase productivity and stabilize product quality through intelligent transformation of workshops. After thorough research, PCI plans to achieve lean, automated, and intelligent production as its goal, take the lead in piloting the update and renovations of intelligent production equipment on the T1 production line of the IG business unit. After the updates and renovations, the output and the direct material costs remain unchanged, and labor costs are significantly reduced.

Succi 接到 David 要求就已立项的 T1 产线智能化改造项目运用新建立的评价机制进行内部投资项目经济评价。 Succi 已取得了 T1 产线更新改造后的场地布局图，确认改造后场地大小不变，按照新拟定的内部技术投资项目基础数据表收集的新旧产线投资数据如下（详见附件 1，为简化计算，所有收支均不考虑账期影响）：

Succi received a request from David to give an internal investment project financial evaluation to the approved intelligent renovation project of T1 production line using the newly established evaluation mechanism. She has obtained the layout plan of renovated T1 production line and confirmed that the site size remains unchanged. The investment data of the new and old production lines, collected according to the newly drafted internal technology investment project basic data table, are as follows (See annex 1 for details. To simplify calculation, impact of account period is not considered for all income and expenditure.):

附件1

Pharmacell内部技术投资项目方案

项目名称T1产线智能化改造项目　　单位：元

分类	项目资料		传统产线	智能产线	说明	提供部门
销售情况	设计产能（吨）		350	350	原材料投入最大产能	生产管理部
	产能利用率		70%	70%	产能利用率的计算基础为设计产能	原料拓展部
	每吨血浆灌装量(瓶)		1,200	1,200	按照标准收得率计算产出	生产管理部
	每瓶单价		400	400	含税	市场营销部
资本支出	投资成本		20,000,000	25,000,000	期初建成投入，含税，税率13%	采购供应部
	预计可使用年限（年）		10	10	同财务折旧年限，采用直线折旧法	
	残值率		5%	5%	固定资产核算制度规定	
	已用年限（年）		4	-		
	目前变现价值		10,000,000	25,000,000	含税	
	最终生产线处置收入		500,000	800,000	不考虑增值税	
成本构成	直接材料成本	每吨血浆年成本	500,000	500,000	含税	财务部
		免疫球蛋白分摊血浆成本占比	30%	30%	按产值占比分摊原材料成本	财务部
		其他耗材每年吨耗用	150,000	150,000	含税	采购供应部
	直接人工成本	年人均成本	120,000	120,000	含工资、奖金、社保、公积金、福利费等直接人工费用	人力资源部
		年均工资增长率	5%	5%		
		生产作业人员人数	30	10		
	维护保养费（元/年）	第1年	-	-	含税，智能产线有三年质保期，投产后三年内无维护保养费。传统产线维护保养费依据以往经验预估，只能产线维护保养费依据设备供应商经验预估	生产管理部
		第2年	50,000	-		
		第3年	50,000	-		
		第4年	70,000	100,000		
		第5年	80,000	120,000		
		第6年	100,000	150,000		
		第7年	120,000	150,000		
		第8年	150,000	180,000		
		第9年	180,000	180,000		
		第10年	200,000	200,000		
	年能源吨耗用		50,000	70,000		
财务指标	增值税率		3%		增值税采用简易征收模式	财务部
	城建及教育费附加		12%		应交增值税×12%	
	所得税率		15%		高新技术企业所得税率	
	必要报酬率		14%		按公司要求的最低回报率	

注：此表适用于新旧设备使用寿命不同的重置性投资项目，请各业务单位按照"提供部门"要求提供项目预测数据并填写到白色区域

问题 1：

请您帮助 Succi 设计使用寿命[1]不同的重置性(即替换现存机器设备)投资项目经济评价模型，选定适用于使用寿命不同的重置性投资项目的经济评价指标，并将 T1 产品线智能化改造项目调研方案代入模型计算，制作 PPT 向公司管理层汇报该方案的经济评价结果并给出投资建议。

Question 1:

Please help Succi design a financial evaluation model for reset investment projects with different service life (i.e. replacing existing machinery and equipment), select financial evaluation indicators suitable for reset investment projects with different service life, and substitute the T1 product line intelligent renovation project plan into the model calculation. Create a PPT to report the financial evaluation results of the plan to PCI's management team and provide investment recommendations as well.

注 1：使用寿命—— 设备从投入使用到报废时间。

Note1：Service life—— The time from when the equipment is put into use to when it is scrapped.

2. 技术投资项目的抉择不是简单的数学题

The choice of technology investment projects is not a simple mathematical problem.

(以下情节为问题 2 提出前的假设情景，非问题 1 的作答提示或引导)

(The following part is a hypothetical scenario before Question 2, not a hint or guidance for question 1)

按照 PCI 公司规定，对于项目投资超过 1000 万元的项目决策需要董事会过会。2023 年 10 月，PCI 公司召开投资专题会议，董事长 Leo、各董事、总经理 David、Succi 参加了会议，会议也邀请了外部财务管理顾问 Lucy 参加。

According to PCI's regulations, decisions on projects with an investment exceeding 10 million RMB will require a board meeting. In October 2023, PCI held an investment themed meeting, attended by the chairman Leo, directors, General Manager David, and Succi. The meeting also invited external financial management consultant Lucy to attend.

David 首先根据管会部的测算结果做了项目投资方案和指标测算结果汇报，最终得出结论：从定量计算的经济评价指标角度来看，本项投资不具备经济性，即不推荐 T1 产线智能化改造项目投资。Leo 听完汇报并未立即表态，他首先征询了 Lucy 的意见，Lucy 也是有备而来，她拿出了国际竞争对手 A&T 公司最新消息：“A&T 公司 2022 年已完成了第二期智能化改造，市场对于 A&T 公司的生产技术创新充满期待，认为 A&T 公司产品未来更具竞争力；国内血液制品行业生产智能化改造刚刚起步，PCI 公司如能率先尝试智能化生产，对公司市场声誉将会产生积极影响。”Leo 随后表态：“我赞同 Lucy 的提议，智能化改造项目不能只盯着眼前的得失，要看到项目的成功对全公司其他产线的示范作用，这是一次积极的尝试，我们可以总结经验，为未来全面实现智能化生产提供经验。管会部今年制定了内部投资项目评价机制，对内部投资项目的经济性评价支持项目投资决策确实起到有效的作用，但是我们还要考虑到，投资决策不是简单的数学题，对于重大投资项目，除了定量方法外，我们还要充分考虑公司战略、市场环境、与投资的关系等定性影响因素。请 David 组织公司各部门共同研究如何将定量分析和定性分析相结合，对公司重大内部投资项目提供投资决策依据。”Leo 会后要求咨询团队配合管会部完成此项工作。

David reported the project investment plan together with the indicator calculation results by the management department and concluded that from the perspective of quantitative financial evaluation indicators, this investment does not have economic viability, and therefore does not recommend investment in the T1 production line intelligent renovation project. Leo didn’t give his feedback immediately, instead he asked Lucy for her opinion first. Lucy presented the prepared latest news from international competitor A&T Company: "A&T has completed their second phase of intelligent renovation in 2022, and the market is full of expectations for their production technology innovation, believing that A&T’s products will be more competitive in the future. The intelligent renovation of production in the domestic blood products industry has just begun. If PCI can take the lead in trying intelligent production, it will have a positive impact on the company's market reputation. ". Leo then said, "I agree with Lucy's proposal. We should not only focus on the front gains or losses of the intelligent renovation project, but also need to consider the exemplary effect of the project's success on other production lines in PCI. This is a positive attempt, and we can summarize the experience for the comprehensive implementation of intelligent production in the future. The management department has formulated an internal investment

project evaluation mechanism this year, which has played an effective role in supporting project investment decisions through financial evaluation of internal investment projects. However, we also need to realize that investment decision is not a simple mathematical problem. For special or important investment projects, in addition to quantitative methods, we also need to fully consider qualitative influencing factors including strategy, market environment, and the relationship with investment. David, please organize relevant departments to jointly study how to combine quantitative and qualitative analysis to provide a basis of investment decision-making for special investment projects. " Leo requested the consulting team to cooperate with the management department to complete this task after the meeting.

问题 2：

投资项目的抉择不是简单的数学题，结合 T1 产品线智能化改造项目投资专题会议，思考从定性角度，还有哪些因素需要纳入考虑，甚至得出和定量分析完全相反的结论？如何平衡定性和定量因素在技术投资决策中的考量？

Question 2:

The choice of investment project is not a simple mathematical problem. Based on the above-mentioned investment meeting of T1 product line intelligent renovation project, please think from a qualitative perspective, which other factors also need to be considered, and even with a conclusion that is opposite to quantitative analysis? How to balance the considerations of qualitative and quantitative factors in technology investment decisions?

- 结束 -
- End -