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Chip equity

Topic	Difficulty	Style
Mergers & Aquisition	Advanced	Candidate-led (usual style)

Problem definition

Our client is an electronics holding called Chip’n’Chip.
They want to **invest** in a Printed Circuit Board (PCB) manufacturer called **OnBoard**, and asked you whether it’s going to be a good investment.
How would you help them?

Summary

Comments

Notice that the client holding does **NOT** want to **buy** the PCB manufacturer entirely, instead **just invest** in it.
This case encompasses very well a private equity investment. It covers both **strategic aspects** as well as a **detailed analysis** of the **ROI**.

Short Solution

Chip’n’Chip should **invest** in OnBoard.

Detailed solution

Paragraphs highlighted in green indicate diagrams or tables that can be shared in the “Shareable information” section.

Paragraphs highlighted in blue can be verbally communicated to the interviewee.

Paragraphs highlighted in orange indicate hints for you how to guide the interviewee through the case.

The following structure gives an overview of the case:

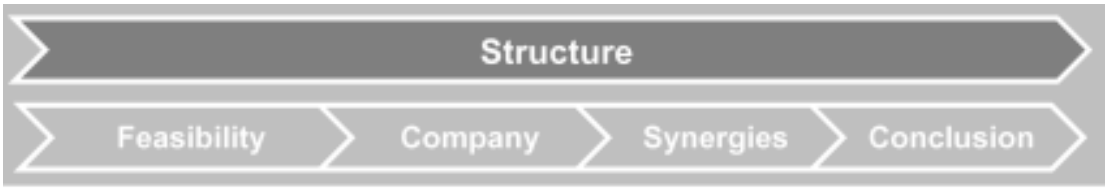

Diagram 1 – Case structure

I. Feasibility

Here the interviewee should investigate **how much Chip’n’Chip** is willing to **invest** in OnBoard and **how much OnBoard** is **asking** for.

- **Availability** of **money** for investment
- Market **attractiveness**
- Recent **growth**
- Competition
- Opportunities to **differentiate** the company’s own products

Market-information that can be shared if asked by the interviewee:

- **The market for the 2-layer PCB technology has been declining globally 4% per year in the last years and tends to keep falling .**
- **The market for the new 3-layer technology had an increase of 10% per year in the last few years (smartphone boom).**
- **OnBoard has a valuation of $320 m. They are looking for a private equity investor to inject $80 m.**

It will be used to expand the Vietnam factory in order to manufacture 6 m units of the 3-layer PCB technology.

- **The 2-layer PCB CANNOT be used in advanced and small equipment like the last generation mobile phones, tablets and laptops (requires the 3-layer PCB).**
- **Chip'n'Chip has more than $80 m for investments.**
- **It requires a 10% ROI in the first year in order to invest.**
- **There is a lot of competition in the industry (mainly in the 2-layer technology).**

Japanese manufacturers control more than 50% of the market, but have been facing stagnation as new manufacturers in Asia improve their technology with less labour costs.

Main conclusions

- **OnBoard** is looking for **$80 m** and, as it is **worth $320 m**, would **give** away **20%** of its shares for the investment
  (as the **new** company **value** would be **$400 m** after investment).
- There is a high **competition** in the industry.
  Producing in China or Southeast Asia is more
  cost-efficient than in Japan or other developed countries.
- The market is divided into **two main technologies**:
  The older one – **2-layer PCB** – is in decline.
  The newer one – **3-layer PCB** – on the other hand is booming.

Give **HINT** if interviewee does **NOT** ask about the 3-layer technology!

II. Company

Here the interviewee should ask about the **attractivity** of **OnBoard**:

- **Profitability**
- **Competencies**
- Production **capacity**
- **Profitability** of new boards

Information that can be shared if asked by the interviewee:

- OnBoard has **profitable factories** in **three** different **countries**: **Germany**, **China** and **Vietnam**.
- The factories are working with the following **capacity utilization**: **Germany 60%**, **China 80%** and **Vietnam 100%**.
- Everything is produced **on demand**.
- The **capacity** of the factories in Germany/Vietnam is **5m boards per year**, whereas the capacity in China is **10m boards per year.**
- So **far** they **only** produce **2-layer** PCBs.

Share **Table 1** with an overview of **production costs** if asked for it.

The profit should be calculated by the interviewee!
The **complete solution** can be found in **Table 2.**

Main conclusions

- OnBoard is **profitable**.
- If the **investment** is **done**, the **new factory** in Vietnam will produce an extra 6 million units of the 3-layer **PCBs**.
  These boards will generate a **profit** of **$3** instead of **$1.5** for the 2-layer ones. The **market** seems very **promising**.

III. Synergies

This is the **KEY ANALYSIS** to **CRACK** the case!

Information that can be shared if asked by the interviewee:

- Chip'n'Chip is a holding that owns electronics **manufacturers** which **need** PCBs. This is a **key synergy** that would make the **investment** in OnBoard **interesting**.
- Chip'n'Chip's companies are all in the US, apart for **one** motherboard **manufacturer**

for high-end laptops in **India**.

- This factory currently **outsources** the **production** of **10 million units** of the 3-layer PCBs.
- The Chip'n'Chip companies in the US buy **20 million** 2-layer PCBs **per year** for a price of **$5**.

Chip'n'Chip companies buy **20 million 2-layer PCBs** in the US at the same price of OnBoard. This is a **hint** that these boards could be **bought** from **OnBoard!**
There would be an **increase** of **OnBoard's** 2-layer PCB **production** to **full capacity** in Germany and China.

Share **Table 3** with an **overview** of the **profits** for **100% production** if the interviewee asks about it.

Main conclusions

- The **profit** due to the **full capacity** of OnBoard would be around **$ 27.5 m**.
- Chip'n'Chip's factory in **India** requires alone **10 m units** of the 3-layer board. That means that if they invested in OnBoard's expansion of the factory in Vietnam, all **6 m boards** produced could be **sold to** the factory in **India**.

The **additional profit** made with the factory **expansion** would be**:**

$$=\#\text{units sold} * \frac{\text{profit}}{\text{unit}}$$

$$=6\,\text{m} * \frac{\$3}{\text{unit}} = \$18\,\text{m}$$

- We conclude that with the **synergies** OnBoard could make **profits** of up to **$45.5 million**.

= $27.5 m + $18m = $45.5 m

As **Chip’n’Chip** would **hold 20%** of OnBoard, they would also have **right** to **20%** of the **profit**.

$$ROI = \frac{\$45.5\,m * 20\%}{\$80\,m} = \frac{\$9.1\,m}{\$80\,m} = 11.3\%$$

That means **ROI** of around **11.3%** for Chip’n’Chip.

IV. Conclusion

Chip’n’Chip **should invest** in the **expansion** of the existing factory in Vietnam for producing 3-layer PCBs.

Main reasons

- Although the market of **2-layer** PCB is on the fall, the **3-layer** technology is on the **rise**, expanding more than 10% a year lately.
- Even **producing** only the older **2-layer** technology, the existing factories in China, Germany and Vietnam are already **profitable**. This is mainly due to the fact that these factories compete with Japanese companies that have higher labor costs.
- Considering **possible synergies** between Chip’n’Chip and OnBoard, OnBoard’s **profit** after the investment would increase up to **$45.5 m**.

Chip’n’Chip’s **share** of the **profits** would be of **$9.1 m**.

That would correspond to a **ROI** of **11.3%**, **satisfying** the **requirement** of at least 10% ROI in the first year.

Case exhibits

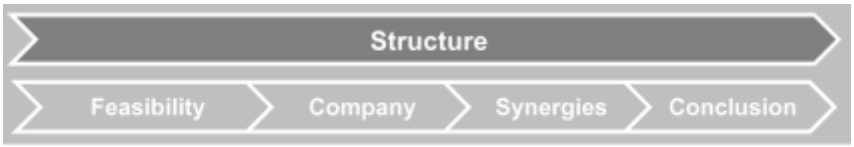

Diagram 1 – Case structure

Cost overview OnBoard

	China	Vietnam	Germany
Price [$]	5	5	5
Production costs (including labor) [$]	2	1.5	3
Other costs [$]	1.5	2	1
Profit margin [$]			

Table 1 – Current unit costs of OnBoard's printed circuit boards

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If the investment takes place, the **unit costs** for the new 3-layer boards will be **exactly** the **same** as for the **old technology**. The **unit price**, however, will be of **$6.5**.

Cost overview OnBoard

	China	Vietnam	Germany
Price [$]	5	5	5
Production costs (including labor) [$]	2	1.5	3
Other costs [$]	1.5	2	1
Profit margin [$]	1.5	1.5	1

Table 2 – Current unit costs of OnBoard's printed circuit boards

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If the investment takes place, the **unit costs** for the new 3-layer boards will be **exactly** the same as for the **old technology**. The **unit price**, however, will be **$6.5**.

That means a profit US$ 3 instead of US$ 1.5.

Profits at 100% production

	China	Vietnam	Germany
Profit margin (US$)	1.5	1.5	1
Units produced (M) (all at 100% capacity)	10	5	5
Total profit (US$ M)	15	7.5	5

Table 3 – Profit from sales of 2-layer PCB at 100% production in all factories

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Assuming the transportation costs from China and Germany to the USA are not significant (as PCBs have a very high value per kilo) this increase in production would result in a **new profit** for the sales of 2-layer PCBs of **US$27.5 million** (15+7.5+5).