AJ CHEMICALS

Growth Strategy
Chemicals

High difficulty
Candidate-led case

This case focuses on the growth and expansion strategy of a chemicals' manufacturer. The case is candidate-led and includes a wide scope of potential topics to cover. As such, it requires a candidate to be highly effective at case leadership and prioritization throughout.

Problem definition

Your client is a chemical manufacturing company, based in North Carolina, USA. The client currently manufactures only one chemical, titanium dioxide. Titanium dioxide is a white pigment with a high refractive index, used in a number of consumer applications.

The client has seen steady growth since its launch, but this growth has slowed in the past three years. The client has highly ambitious goals for the future, however, and seeks to increase its growth rate such that it can grow its revenues by 50% over the next five years.

The client has hired you and your firm to provide an assessment on the feasibility of this goal and to recommend potential approaches to achieve it.

Can the client achieve its objective of growing sales by 50% over the next five years? If so, how should it achieve this goal?

Relevant information

If asked, please share that:

- Titanium dioxide is used in a wide range of applications. The largest segments of the market are paint & inks, toothpaste, cosmetic and beauty products, and food colorings. However, there is a "long tail" of additional products that make use of the chemical
- The client is a relatively new player in the market, and was founded 15 years ago
- The client's focus is on growth. It is willing to pursue this even if its profit per order takes a small hit

Structuring

Guidance for interviewer

In this case in particular, candidates will occasionally focus on demand components in their structure but miss operational or practical constraints (represented in drivers 3 and 4 in the below structure).

If a candidate doesn't hit upon these dimensions independently, hint at them before moving on. If a candidate still does not raise them, the interviewer should mention explicitly that such constraints should be considered during the case.

Possible answer

1. *How much growth is required to reach the client's goal?*
   a. *Scale client would reach at current growth rate*
   b. *Growth required on top of current growth rate*

2. *Which market or segment is of the right size and attractiveness for the client to achieve its growth ambition?*
   a. *Grow within the client's core product area:*
      - *Expand market share within existing customer segments*
      - *Expand to reach new customer segments*
   b. *Expand into new product areas:*
      - *New chemical products*
      - *Entirely new verticals*

3. *Can the client's supply chain manage growth of 1.5X its current sales?*
   a. *Source raw materials at higher scale*
   b. *Handle production increase*
   c. *Manage distribution of higher volumes*

4. *Does the client have the requisite financial capital to invest in expansion?*
   a. *Client's current capital position and potential to invest*
   b. *Client's access to capital to fund further expansion*

Driver 1: How much growth is required to meet the client's goal?

Relevant information

If asked, please share that:

- The client has historically grown at 8% per year. However, over the past three years the client has grown at 5% per year
- The overall market for titanium dioxide is growing at 4% per year
- The client's current revenue is $400m

Guidance for interviewer

Candidates should begin by seeking to understand the magnitude of the goal: specifically, how much growth should be expected in the client's "do nothing" scenario, and therefore how much incremental growth is required to reach its 1.5x growth goal?

If a candidate doesn't touch upon this topic, the interviewer may steer them to it more directly.

Candidates should be expected to estimate the approximate size of the client after five years at 5% growth, simply by computing the growth for each year sequentially on paper. Candidates may also estimate the growth rate % required to reach the new growth target, but this is not required.

Possible answer

The client's growth aspiration is ambitious but achievable, given its current growth rate and the market context.

The client aims to grow revenue to $600m, 50% above its current sales. At its current growth rate of 5%, the client will reach only c.$510m in sales in 5 years' time. In other words, the client's current growth rate takes it just over halfway towards the goal. To realize the additional $90m, the client will need to reach a higher growth rate – around 8% or 9%.

This is ambitious, particularly since the client is also already outstripping market growth. However, it does not feel impossible: the client achieved 8% growth in the past, and is smaller than other players in the market, suggesting that there remains additional potential to grow. To meet this ambition, the client may need to target high-opportunity segments within the market. Alternatively, the client may have to consider entirely new products or markets.

Driver 2: Which market or segment is of the right size and attractiveness for the client to achieve its growth ambition?

Relevant information

New products and verticals

- The client's operation is entirely geared around titanium dioxide production. To create facilities to produce new chemical products would take at least 4 years
- The client benefits from proximity to raw materials for titanium dioxide. It has built some capabilities for chemical production, and access to relevant customers, but beyond this lacks any competitive differentiation for production of other chemicals
- The client does not have capabilities that could extend to the production of other industrial or consumer products besides chemicals

Segments within the titanium dioxide market:

- The size of the global market is $30b.
- There are four major segments in the market: paint & inks; food coloring; toothpaste; cosmetic and beauty products. There is also a considerable "long tail" of additional applications for titanium dioxide beyond this
- Today the client focuses almost exclusively on pigments for paints and inks (90% of client sales), with a small proportion of sales in food colorings (10%)
- Paints and inks reflect 50% of the total market size, while food colorings reflect 10% of the overall market. Both segments are growing at c.3% per annum
- We have no data on the size of the toothpaste segment at this stage. However, we know that toothpaste manufacturing is a concentrated market where players tend to enter into very long supply contracts with raw material providers. Therefore, we do not expect the client to gain significant traction in this segment quickly
- We have several data points on the beauty and cosmetics segment:
    - The products in scope include any beauty or cosmetic product with white pigment, including make-up, skin-creams, shaving creams, shampoos, and sunscreen
    - The market is relatively fragmented and fast-moving. Established players often test and release new product lines. Meanwhile, new entrants are disrupting the market in many areas, notably in beauty products
    - The market is growing relatively quickly, at 6% per year
    - The client's grade and quality of titanium dioxide would be well suited to requirements in this segment of the market

Inputs for market sizing of cosmetics and beauty segment

- The global population can be assumed to be 7bn
- Approximately one-half of cosmetic & beauty products contain titanium dioxide

- The input cost of titanium dioxide varies considerably by product type and size. For the purposes of this estimation, a candidate may assume the input cost to be $0.05 for an average cosmetic product

Guidance for interviewer

The candidate is likely to explore whether new growth opportunities exist for the client – either segments within the titanium dioxide market, or entirely new product areas.

This topic should be a conversation, with the candidate probing for information to reach a judgement.

A candidate should eventually land on the cosmetics and beauty segment as a potentially attractive area. The candidate should then be encouraged to estimate the size of this market, to understand whether it has the scale to be viable for the client's ambition level.

As with any market sizing, the specific number the candidate reaches is less important than the logic, structure, and numerical analysis that is used to reach it. However, the candidate should sense-check their estimate and comment upon the results if it is far off the residual $12bn market size left over from the two categories already mentioned (i.e., since paints & inks and food colorings reflect 60%, or $18bn, of the $30bn market).

Possible answer

The client cannot pursue new products or verticals to achieve its goal in this timeframe: the time required for the client to develop facilities to achieve this would take up most of the five-year period, and the client lacks obvious competitive differentiation in new verticals.

The client should therefore focus on potential opportunities to further grow within the titanium dioxide market. Of the segments we're not playing in today, toothpaste looks unfavorable: customers are large, and locked into long-term supply contracts, making it hard to access.

Cosmetic and beauty products appear to be a more fruitful segment to explore, with a relatively fast growth rate and a relatively accessible customer base. However, we should perform a market sizing to ensure it is of sufficient size to be attractive.

We can begin such an estimation with the global population, and split this into segments based on wealth. We'll then estimate the consumption of cosmetic & beauty products in each group, and focus on the product set that contains titanium dioxide white pigment. We'll then multiply this product set by the cost of titanium dioxide per unit.

Starting with a 7bn global population split by income, let's consider three groups:

- *Higher-income: 1bn*
- *Middle-income: 3bn*
- *Lower-income: 3bn*

We'll estimate consumption patterns of cosmetic goods as follows for each group:

- *Higher-income: 30 products per year*
- *Middle-income: 20 products per year*
- *Lower-income: 10 products per year*

This leads to 120bn beauty and cosmetic products: [1 x 30 = 30bn] + [3 x 20 = 60bn] + [3 x 10 = 30bn] = 120bn. Around one-half of such products contain titanium dioxide, leading to 60bn products in scope.

We must then multiply this product total by the cost of titanium dioxide per unit, which is estimated at $0.05 on average.

This means that the total market size for titanium dioxide in this segment is $3bn. This seems reasonable, given that we know the market areas we have not yet explored – this category, as well as toothpaste, and the "long tail" of other applications – total $12bn of the market. It's also a viable size to target: for our client's growth objective of $90m on top of current growth, only 3% of the market must be captured. The cosmetic and beauty segment therefore does seem an attractive area to target for our client's growth ambition.

Driver 3: Can the client's supply chain manage growth of 1.5X above current sales?

Relevant information

- The client's production facilities can manage the growth comfortably with some additional investment. They are built such that we have "room to grow" with significant expansion
- The workforce can expand to meet the demand. The client can hire more workers and/or change shift patterns as required to meet the demand
- Distribution can also be scaled. Our clients' outbound logistics partners have capacity to meet our requirements
- Raw materials can generally be sourced at higher scale, but anthracite coal inputs are likely to be a challenge. The following information may be shared on anthracite coal:
    - Anthracite coal is a major input into titanium dioxide production. It is a high-carbon, highly-dense form a coal produced only in a small number of locations worldwide
    - The client sources most of its anthracite today from mines in Pennsylvania, USA. However, all mining capacity in this region is contracted to the client or other firms for the next five years. The client must therefore seek out new locations
    - The only viable option for sourcing anthracite within this timeframe is mines in Ukraine
- The major issue with sourcing from Ukraine is transportation cost. The client is comfortable with other potential supply risks in the region

Guidance for interviewer

At some point in the case, a candidate should move to explore the operational viability of this sales expansion. When this occurs, the case should again enter a dialogue: the candidate is likely to test a number of different aspects of the client operations to identify where challenges may exist.

Raw materials sourcing is the major area worthy of discussion – in particular, sourcing anthracite coal. Once a candidate hits upon this, they should be asked about potential challenges in sourcing this material from the available source in Ukraine, and encouraged to think creatively about this.

The key issue in sourcing from Ukraine is transportation cost. If the candidate does not do so directly, the interviewer should test the candidate on creative ways to work around the transportation cost issue from this region.

After the candidate has outlined their ideas on the above, the interviewer should share that with bulk contracts and some use of local storage to manage inventory, a reasonable landed cost can be achieved for the Ukrainian anthracite.

Possible answer

It seems like the majority of operational processes can scale to meet the demand increase. However, the sourcing of anthracite coal could be a challenge.

Assuming we need to source the material from Ukraine, there are a number of considerations to take into account:

- *Additional transportation cost. This is likely to be a factor affecting our ability to serve the increased demand profitably*
- *Lead times. This will affect our responsiveness to customers*
- *Supply risk. Ukraine is in part subject to conflicts, and is less politically stable at present than the USA. It therefore does introduce higher risk of supply disruption than ordering from the US alone. Our client will need to find ways to mitigate this*

Depending on the cost of the raw material per tonne, any change in transportation cost could be a major issue for the viability of our plans. We need to explore whether the materials can be sourced at a reasonable cost before proceeding.

Thinking creatively, there are a number of innovative approaches to source from Ukraine at reasonable cost:

- *The transportation cost is related to the number of ships that we would need to use to transport coal. Maybe we can think of better ways to pack coal in the ship. For example, we could powder the coal so that it occupies less volume and we can pack in more coal on a single ship*
- *We can consider moving some of the pre-processing work to Ukraine from the US. For example, we can move the work of cleaning the coal and removing dirt/soil to Ukraine*
- *We can get into long term contracts with coal manufacturers/shipping companies to get better cost*
- *We can consider acquiring a shipping company to get further advantages*
- *We can build more local storage, so that we can order in larger batches and store higher volumes for use locally*

Driver 4: Does the client have the requisite financial capital to invest in expansion?

Relevant information

If asked, please share that:

- The ramp-up in production capacity would require capital investment over and above current plans
- In addition, a larger proportion of the client's cash than at present would be absorbed by longer-lead-time anthracite coal procurement in Ukraine
- However, none of these issues present a major challenge to the client. The client has significant capital to invest of its own, and ample opportunity to borrow on favourable terms to finance a well-planned expansion

Possible answer

Funding does not seem to be a major barrier to a client in this situation. The client could finance the required expansion and, if necessary, borrow to enable further growth

Conclusion

What's your overall recommendation to the client?

We were asked if the client could meet its target of 50% growth, reflecting $90m growth over the period above current plans. We've found that the client can meet this goal, and it can do it by focusing on growth in the cosmetics and beauty segment for titanium dioxide.

Specifically, we've uncovered the following from our assessment:

- *The client is not present in the beauty & cosmetics segment, but it is an attractive segment to approach. It is fast-growing and relatively fragmented. It is also quite large: at $3bn in size, the client need only take a small share of the market to reach its goal*
- *The client's supply chain can handle the growth in volume. While we must source inputs from new locations, this is manageable by the client*
- *From a financing perspective, the client has the capital to invest in expansion – and has access to new capital opportunities if required*

As a next step, we recommend that the client start exploring potential customers to target and defining its go-to-market strategy for the cosmetics & beauty segment.