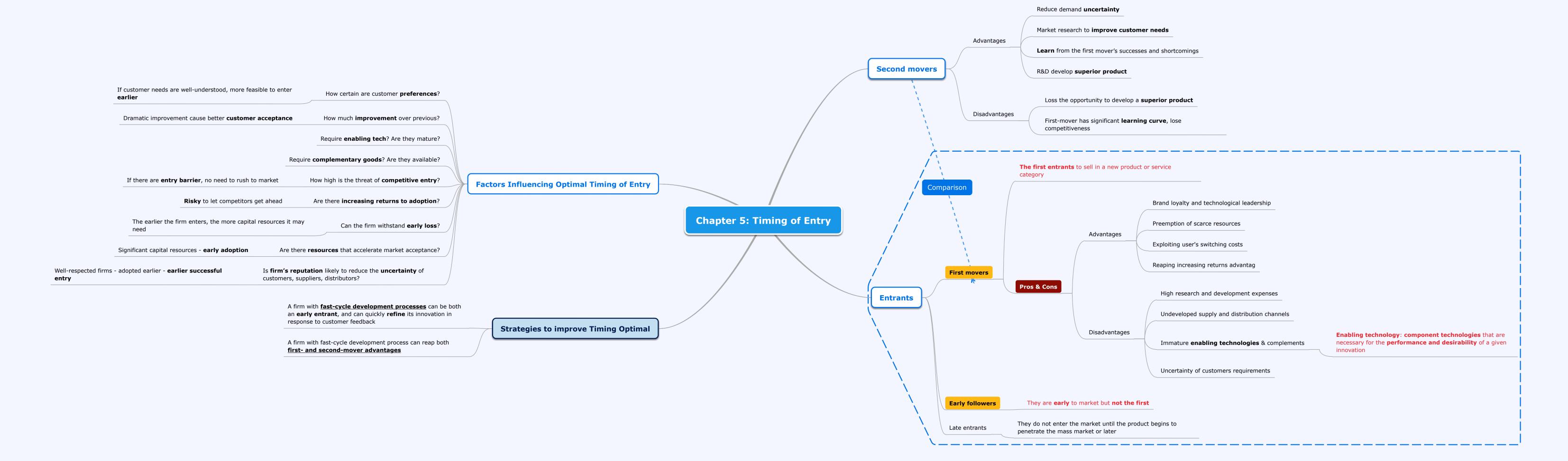
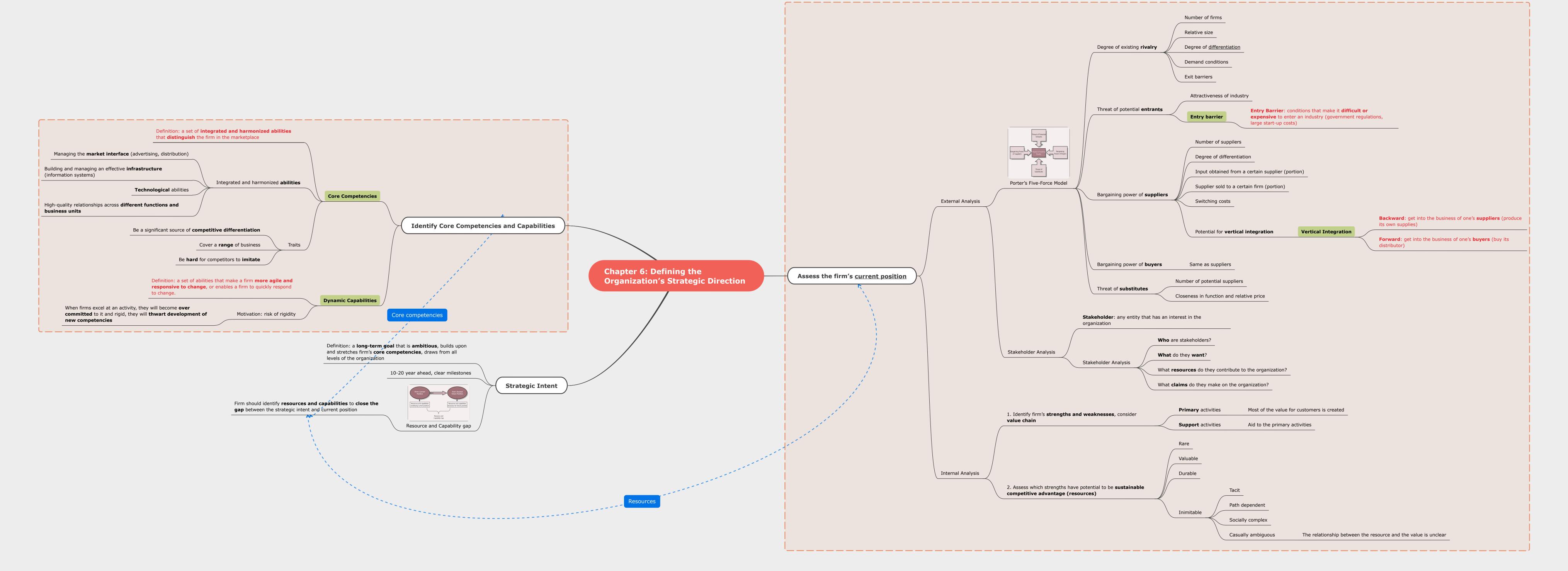


Many industries exhibit **increasing returns to adoption**: the more a technology is <u>adopted</u>, the more <u>valuable</u> it becomes When the **rate of return** from a product or process increases with the size of its installed base Cost decreases Number of production increases Performance increases The learning curve Learning Effect The ability of an organization to recognize, assimilate, and **utilize** new knowledge **Absorptive Capacity** Firms develop **new technologies ahead** of others may have an advantage in staying ahead Market force Increasing returns Sources Definition: the value of good to a user increases with the number of other users of the same or similar good Common in industries that are physically networked **Installed base**: the number of users of a particular good Network Externalities Complementary goods: additional goods and services that Occurrence enable or enhance the value of another good Arise when compatibility or **complementary goods** are important **Dominant Design** Self-reinforcing cycle Cycle: a tech with a large installed base attracts developers of complementary goods, a tech with a wide range of complementary goods attract users, increased installed base. Government regulations induce adherence to a dominant Government regulations design, since the <u>compatibility</u> among technologies bring welfare to customers Firms supporting winning tech earn huge reward, others may Natural monopolies be locked out Increasing returns to adoption imply tech trajectories follow Path dependencies path dependencies Far-reaching influence It shapes future technological **inquiry** in the area Functions Network externality returns: the value customers reap as a Aesthetics Technology **stand-alone value** larger portion of the market adopts the same goods The result: Winner-Take-All market (compatibility, complementary goods, further development of chapter 4: Standard Battles and tech) - s-shape Ease of use **Multiple Dimensions of Value Design Dominance** Monopoly costs: the costs users bear as a larger portion of the market adopts the same good (monopolist charge higher The size of the technology's **installed base** price, less product variety) - exponential Network Externality value The availability of complementary goods Whether the "Winner-Take-All market" result good for Relationship: both arise with the cumulative market share. customers? When monopoly costs exceed network externality returns, intervention may be warranted. **Optimal** market share: crossing point A. Network externalities value B. Stand-alone value + Network externalities value One technology A. When A has more than 50% market share, it is more attractive Cumulative market share determines which tech yields more B. When A has more than 60% market share, it is more Two competing technology attractive (Indifference Point) B dominates A dominates When customer requirements for network externalities value are satiated at lower levels of market share, more than one dominant design thrive Competing for Design Dominance in Markets with Network Externalities Two technology (special case) (Indifference Region) Reduce the **purchase cost** of consumers Reduce user"s learning cost Take the **lead in introducing** products Market share expansion strategy Alliance, develop tech Seek help from venture captivated Strengthen technical training, make it the **mainstream** Make product more **distinctive**, **incompatible** with Lock-in strategy competitors' product Integral discount to consumers





Set a fixed R&D budget: a percentage of previous year's sales

Set a fixed R&D budget and uses a rank ordering of possible projects to determine which should be funding

The Development Budget

Why choose innovation projects?

The ratio of R&D expenditures to sales

R&D Intensity

Large firm fund internally, start-ups fund externally

First stage, start-ups should rely on family, friends, and credit cards

Obtain funding from government grants and loans

Finance new technology strategies

Angel investors, venture capitals

_______ Time value of money: the monetary value of the same amount at different times is not equal Net cash flow = cash inflow - cash outflow The present value of cash inflow minus the present value of cash outflows net present value (NPV) The **time** required to **break even** on a project using discounted cash flows (DCF) The discount rate that makes the net present value of internal rate of return (IRR) Discounted Cash Flow (DCF) Provide concrete financial estimates Strengths Consider timing of investment and time value of money Quantitative methods Strengths and Weaknesses Weaknesses Fail to capture strategic importance of project Applies **stock option model** to non-financial resource investments The cost of R&D — the price of a call option Mechanism The cost of future investments — the exercise price The returns to the R&D investment — the value of a stock purchased with a call option Many innovation models do not conform the market Limitation assumptions of option model Role of customer Compatibility and ease of use How to choose innovation projects? Distribution Definition: used to assess **different dimensions** of the Pricing Screening Questions project decision Existing capabilities Role of capabilities Competitors capabilities Future capabilities Project timing and cost Qualitative methods Managers map their R&D projects according to <u>levels of risk</u>, resource commitment and timing of cash flows The Aggregate Project Planning Framework Definition: a simple method for ranking ideas and different Ideas are put on cards For each dimension, the cards are stack in order of their performance Several rounds of sorting and debate, then achieve consensus Definition: estimates the specific value individuals place on some attribute of a choice A card with products with different features and price Conjoint Analyisis Individuals rate each models in terms of desirability Quantitative + Qualitative methods **Multiple regression** — assess the degree to which each attribute influences the overall ratings Definition: A method of ranking projects based on **multiple** Data Envelope Analysis (DEA) decision criteria by comparing them to a hypothetical efficiency frontier.

