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Promoting Tea as the Engine of Growth
for the Black Sea Basin Area

Production management

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INTRODUCTION

- It is defined as **planning , implementation** and **control** of industrial production process to ensure smooth and efficient operation. production management techniques are used in both **manufacturing and service industries.**
- Simply, production management is a process of **planning, organizing, directing** and **controlling** the activities of the production function.

Production Management

Operation Management

1. It's concerned with manufacturing

1. It is concerned with services

2. Out put is tangible

2. Output is intangible

3. Job use less labour and more equipment

3. Job use more labour and less equipment

4. There is no customer participation

4. Frequent customer participation

HISTORY

- For over **2** centuries operations and production management has been recognised as an important factor in a **country's economic growth**.
- The traditional **view** of manufacturing management began in **18th** century when **Adam Smith** recognised the **economic benefits of specialisation of labour**. He recommended breaking of jobs down into **subtasks** and recognises workers to **specialised tasks** in which they would become highly skilled and efficient.

- In the early **20th** century, **F.W. Taylor** developed **scientific management**.
- From then **till 1930**, many techniques were developed prevailing the traditional view.
- **Production management** becomes the acceptable term from **1930s to 1950s**. As F.W. Taylor's works become more widely known, **managers developed** techniques that focussed on **economic efficiency** in manufacturing.

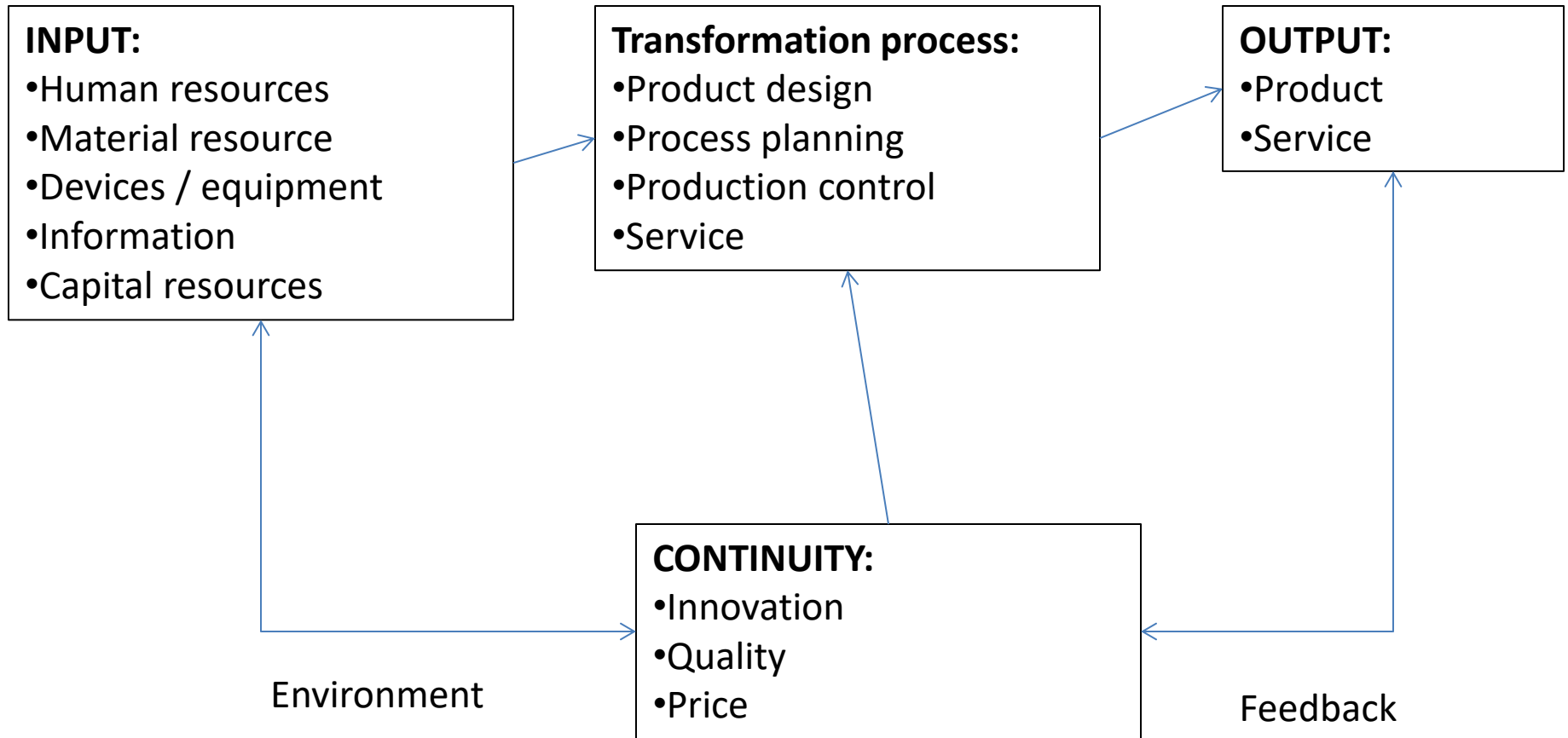
CONCEPT OF PRODUCTION

- Production is defined as “*the step-by-step conversion of one form of material into another form through chemical or mechanical process to create or enhance the utility of the product to the user.*”
- Thus production is a **value addition process**. At each stage of processing, there will be value addition.
- **Edwood Buffa** defines production as ‘*a process by which goods and services are created*’.

PRODUCTION SYSTEM

- The production system of an organization is that part, which **produces products** of an organization.
- It is that activity whereby **Resources**, flowing within a defined system, are **combined & transformed** in a controlled manner **to add value** in accordance with **the policies communicated by management**.

Production scheme system



Characteristics Of Production System

- 1. Production is **an organized activity**, so every production system has **an objective**.
- 2. The system **transforms** the various Inputs to useful Outputs.
- 3. It doesn't operate in **Isolation** from the other organization system.
- 4. There exists **a feedback** about the activities, which is essential **to control and improve system performance**.

CLASSIFICATION

- **Production systems can be classified as:**
 1. Job Shop Production
 2. Batch Production
 3. Mass Production
 4. Continuous Production

Production and productivity difference

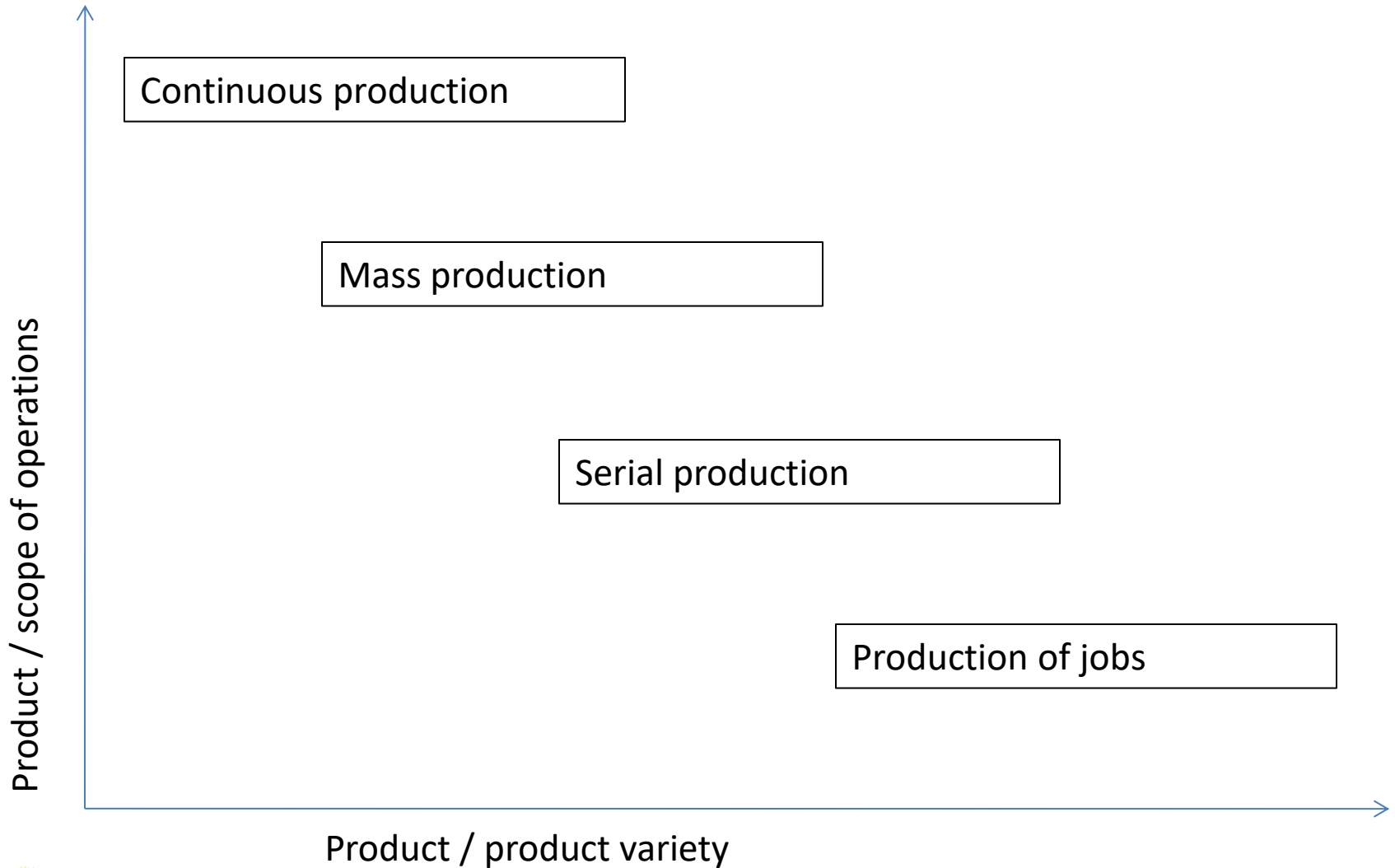
- Production is the quantity of the finished product
- Productivity is the ratio of the number of products produced to the number of employees

$$\text{Productivity} = \frac{\text{Product quantity}}{\text{Number of people}}$$

Example

- "A" business produces 40 chairs with 5 employees
- Production: 40 chairs
- Productivity: $40 \text{ seats} / 5 \text{ employees} = 8$

Production system classification



JOB SHOP PRODUCTION

- Job shop production are characterised by manufacturing of **one or few quantity of products designed** and produced as per the specification of customers within **prefixed time and cost**.
- The distinguishing feature of this is **low volume & high variety of products**.
- A job shop comprises of **general purpose machines** arranged into **different departments**.
- Each job **demands unique** technological requirements, demands processing on machines in a **certain sequence**.

Characteristics

- 1. **High variety** of products and low volume.
- 2. Use of **general purpose machines** and facilities.
- 3. **Highly skilled** operators who can take up each job as a challenge because of uniqueness.
- 4. **Large inventory** of materials, tools, parts.
- 5. **Detailed planning** is essential for sequencing the requirements of each product, capacities for each work centre and order priorities.

ADVANTAGES

- 1. Because of general purpose machines and facilities **variety of products** can be produced.
- 2. Operators will **become more skilled** & competent, as each job gives them learning opportunities.
- 3. **Full potential of operators** can be utilised.
- 4. Opportunity exists for **creative methods & Innovative ideas**.

LIMITATIONS

- 1. **Higher cost** due to frequent set up changes.
- 2. **Higher level of inventory** at all levels and hence higher inventory cost.
- 3. Production planning is **complicated**.
- 4. **Larger space** requirements.

BATCH PRODUCTION

- Batch production is defined *“as a form of manufacturing in which the job passes through the functional departments in lots or batches and each lot may have a different routing.”*
- It is characterised by the manufacture of **limited number of products** produced at regular intervals and **stocked awaiting sales**.

CHARACTERISTICS

- 1. There is **shorter production runs**.
- 2. Plant and machinery are **flexible**.
- 3. Manufacturing lead **time & cost are lower** as compared to job shop production.

ADVANTAGES

- 1. **Better utilisation** of plant and machinery.
- 2. Promotes **functional specialisation**.
- 3. **Cost** per unit is **lower** as compared to job shop production.
- 4. **Lower investment** in plant and machinery.
- 5. **Flexibility** to accommodate and process **number of products**.
- 6. **Job satisfaction** exists for operators.

LIMITATIONS

- 1. **Material handling is complex** because of irregular and longer flows.
- 2. **Production planning and control is complex.**
- 3. Work in process **inventory is higher** compared to continuous production.
- 4. **Higher set up costs** due to frequent changes in set up.

MASS PRODUCTION

- *‘ Manufacture of discrete parts or assemblies using a continuous process are called mass production ’.*
- This production system is justified by **very large volume of production.**
- The machines are arranged in a **line or product layout.** Product and process standardisation exists and all outputs follow the **same path.**

CHARACTERISTICS

1. Standardisation of product and process **sequence**.
2. **Large** volume of products.
3. Shorter cycle **time** of production.
4. Lower in process **inventory**.
5. Perfectly balanced **production lines**.
6. Production planning and control is **easy**.
7. Material handling can be completely **automatic**.

ADVANTAGES

- 1. **Higher rate** of production with reduced cycle time.
- 2. Higher capacity utilisation due to **line balancing**.
- 3. **Less skilled** operators are required.
- 4. **Low process** inventory.
- 5. **Manufacturing cost** per unit is low.

LIMITATIONS

- 1. **Breakdown** of one machine will stop an entire production line.
- 2. **Line layout needs** major change with the changes in the product design.
- 3. **High investment** in production facilities.
- 4. **The cycle time** is determined by the slowest operation.

CONTINUOUS PRODUCTION

- Production facilities are arranged as per the sequence of production operations **from the first operations to the finished product.**
- The items are made to flow through the sequence of operations through material handling devices such as **conveyors, transfer devices, etc.**

CHARACTERISTICS

- 1. **Dedicated** plant and equipment with **zero flexibility**.
- 2. Material handling is **fully automated**.
- 3. Process follows a **predetermined** sequence of operations.
- 4. Component materials can't be readily **Identified** with final product.
- 5. Planning and scheduling is a **routine action**.

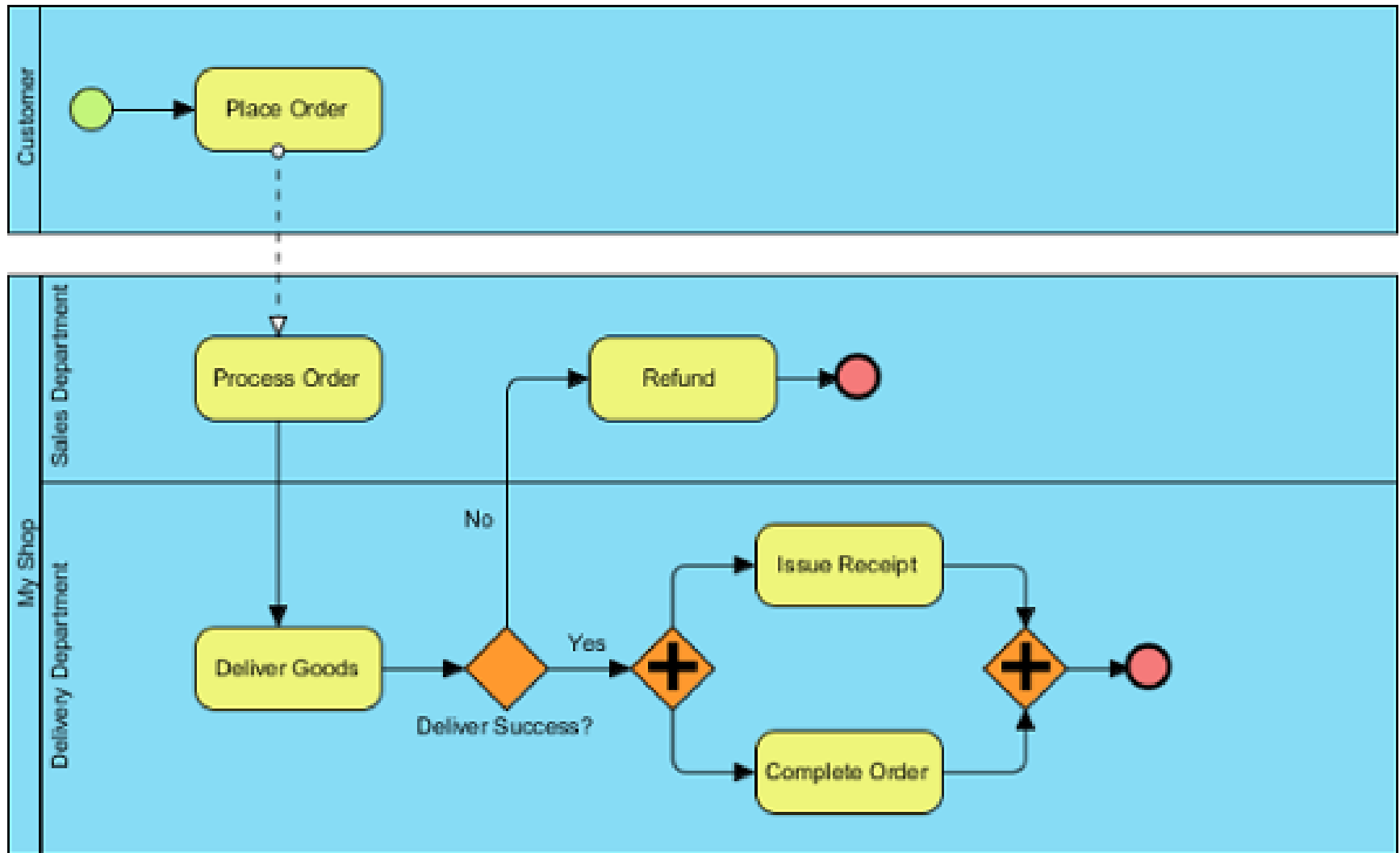
ADVANTAGES

- 1. **Standardisation** of product and process sequence.
- 2. **Higher rate** of production with reduced cycle time.
- 3. Higher capacity utilisation due to **line balancing**.
- 4. Manpower is not required for material handling as it is **completely automatic**.
- 5. Person with **limited skills** can be used on the production line.
- 6. **Unit cost is lower** due to high volume of production.

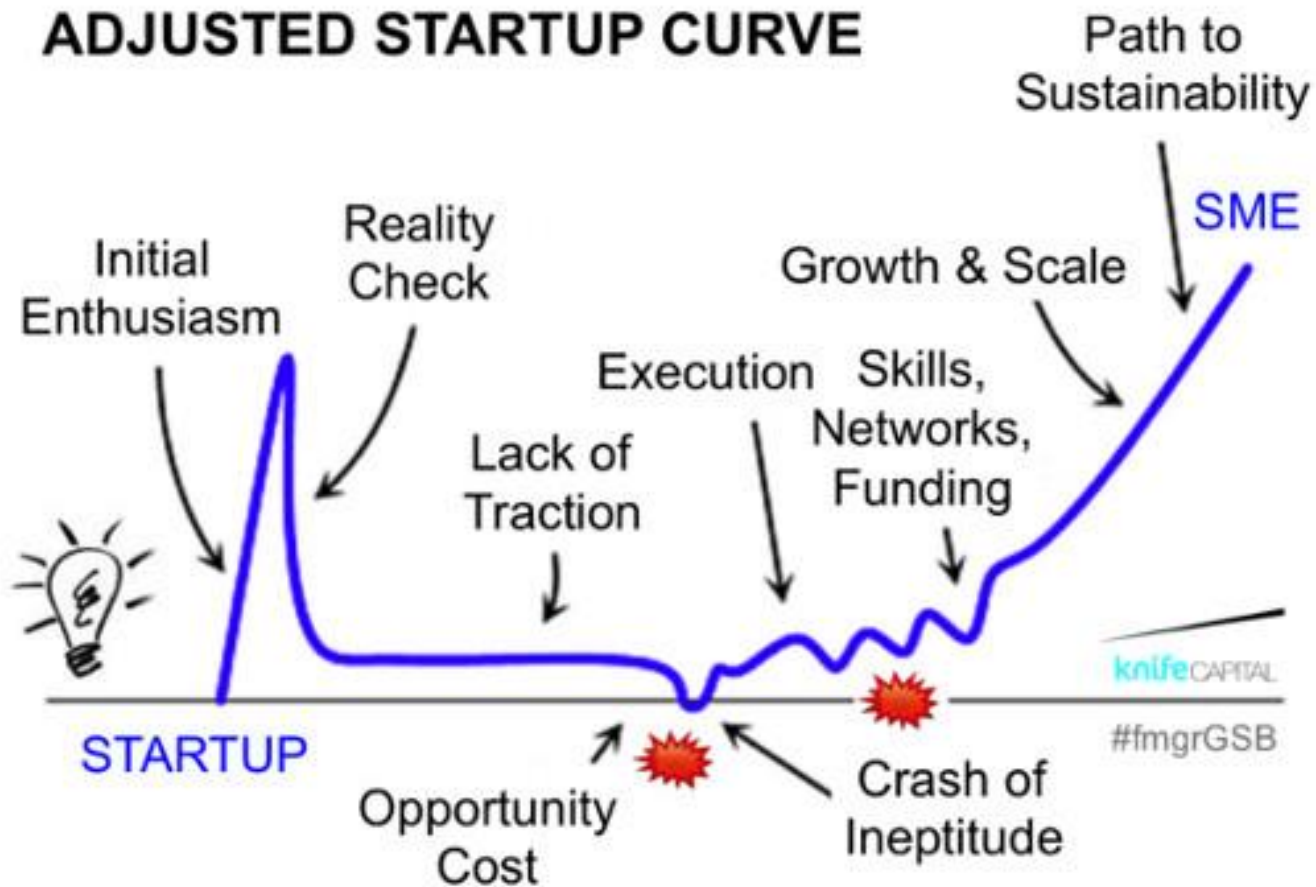
LIMITATIONS

- 1. **Process number of products** doesn't exist.
- 2. **Very high investment** for setting flow lines.
- 3. **Product differentiation** is limited.

Business Process Sample



Startup road map



OBJECTIVES OF PRODUCTION MANAGEMENT

- The objective of the production management is '*to produce goods services of right quality and quantity at the right time and right manufacturing cost*'.
- **RIGHT QUALITY:**
The quality of product is established based upon the **customers needs**. The right quality is not necessarily best quality. It is determined by the **cost** of the product and the **technical** characteristics as suited to the specific requirements.i.e.

- **2. RIGHT QUANTITY**

The manufacturing organization should produce the products in **right number**. If they are produced in excess of demand the capital will block up in the form of inventory and if the quantity is produced in **short of demand, leads to shortage of products.**

- **3. RIGHT TIME**

Timeliness of delivery is one of the important parameter to judge the **effectiveness** of production department. So, the production department has to make the **optimal utilization of input resources** to achieve its objective.

- **4. RIGHT MANUFACTURING COST**

Manufacturing costs are established before the product is actually manufactured.

- All attempts should be made to produce the products at **pre-established cost**, so as to reduce the variation between **actual and the standard (pre-established) cost**.

Comparison of quality management systems

TQM versus QMS

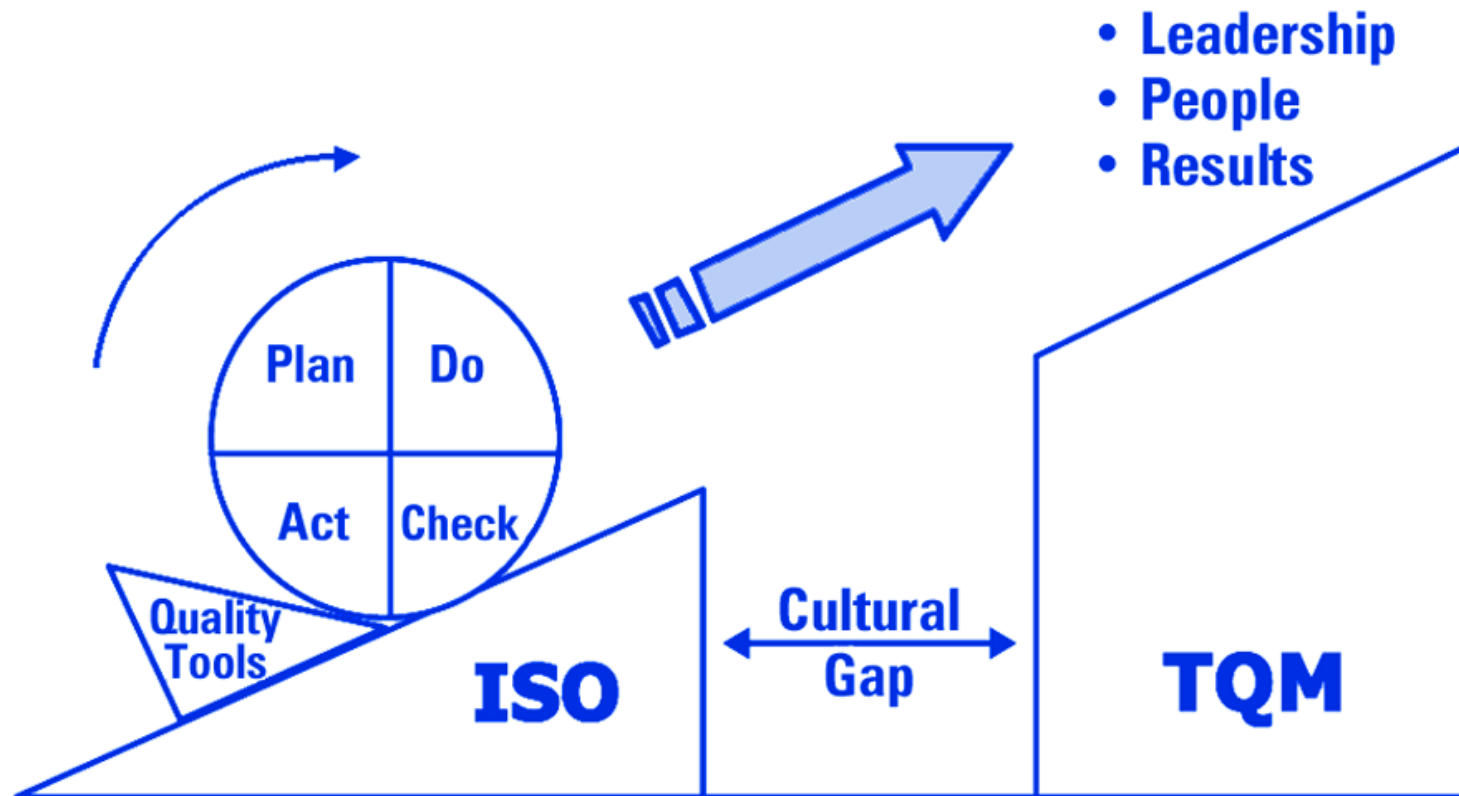
Total Quality Management (TQM) principles

- TQM is for **manufacturing and engineering** sectors principles.
- Standardization of processes across organizations
- Optimization of resources
- Elimination of waste and removal of stages that do not add any value
- Systems to facilitate improvement
- Benchmarking /competitiveness
- Review and continuous improvement
- Cause – Effect relationship and statistical analysis
- Quality improvement teams and divisions as ‘cost centres’.

Quality Management Systems (QMS) principles

- QMS is a **service delivery system**, based on the **8 principles** of -
- Customer focus
- Involvement of stakeholders
- Process as the basis of organizing service delivery
- System as the basis of managing service delivery
- Continual improvement
- Analysis of data and information for decision making
- Mutually beneficial relationship with supplier chain to create value addition
- Leadership for keeping employees motivated and establishing a unity of purpose in the organization.

ISO and TQM quality management systems



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SCOPE OF PRODUCTION MANAGEMENT

- Production management concern with the **conversion of inputs into outputs**, using physical resources, so as to provide the desired utilities to the customer while meeting the other organizational objectives of effectiveness, efficiency and adoptability.
- It distinguishes itself from other functions such as personnel, marketing, finance, etc., by its primary concern for **'conversion by using physical resources.'**

- **Following are the activities which are listed under production management functions:**
- 1. Location of facilities
- 2. Plant layouts
- 3. Product design
- 4. Process design
- 5. Production and planning control
- 6. Quality control
- 7. Materials management
- 8. Maintenance management.

LOCATION OF FACILITIES

- Location of facilities for operations is a **long-term capacity decision** which involves a **long term commitment** about the geographically static factors that affect a business organization. It is an important strategic level decision-making for an organization.
- **The selection of location is a key-decision** as large investment is made in building plant and machinery.

- An improper location of plant may lead to waste of all the investments made in plant and machinery equipments.
- Hence, location of plant should be based on the company's expansion plan and policy, diversification plan for the products, changing sources of raw materials and many other factors.
- The purpose of the location study is to find the optimal location that will results in the greatest advantage to the organization.

PRODUCT DESIGN

- Product design deals with conversion of ideas into reality. Every business organization have to design, develop and introduce new products as a survival and growth strategy.
- Developing the new products and launching them in the market is the biggest challenge faced by the organizations.
- The entire process of need identification to physical manufactures of product involves three functions: marketing, product development, manufacturing.

- Product development translates the needs of customers given by marketing into technical specifications and designing the various features into the product to these specifications.
- Manufacturing has the responsibility of selecting the processes by which the product can be manufactured.
- Product design and development provides link between marketing, customer needs and expectations and the activities required to manufacture the product.

PROCESS DESIGN

- Process design is a macroscopic decision-making of an overall process route for converting the raw material into finished goods.
- These decisions encompass the selection of a process, choice of technology, process flow analysis and layout of the facilities.
- Hence, the important decisions in process design are to analyze the workflow for converting raw material into finished product and to select the workstation for each included in the workflow.

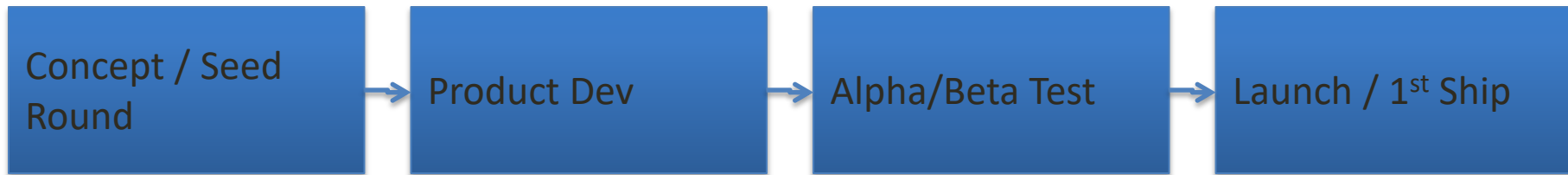
PRODUCTION PLANNING AND CONTROL

- The principle of production planning and control lies in the statement 'First Plan Your Work and then Work on Your Plan'.
- Main functions of production planning and control includes planning, routing, scheduling, dispatching and follow-up.

- **Planning** is deciding in advance what to do, how to do it, when to do it and who is to do it.
- **Routing** may be defined as the selection of path which each part of the product will follow, which being transformed from raw material to finished products. Routing determines the most advantageous path to be followed.
- **Scheduling** may be defined as 'the fixation of time and date for each operation' as well as it determines the sequence of operations to be followed.

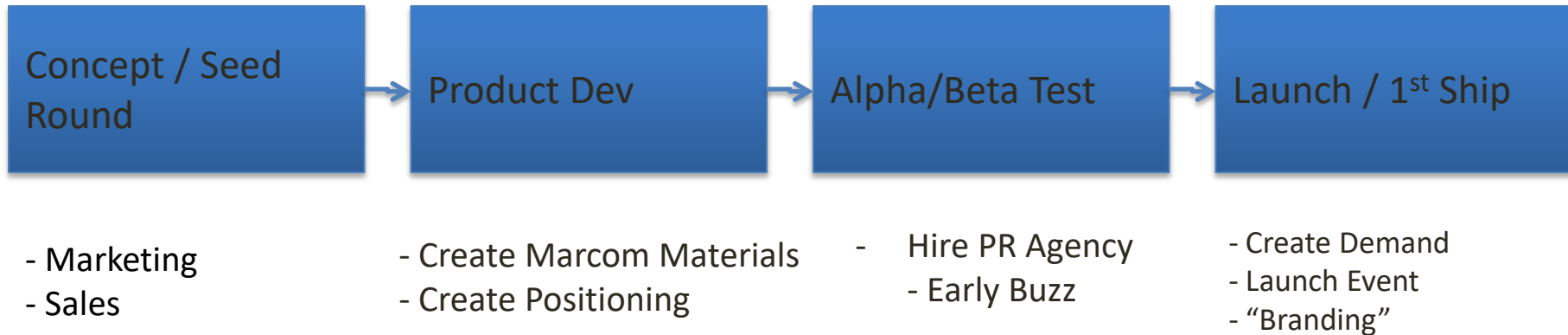
- **Dispatching** is concerned with the starting the processes. It gives necessary authority so as to start a particular work, which has already been planned under 'Routing' and 'Scheduling'.
- The function of **follow-up** is to report daily the progress of work in each shop in a prescribed proforma and to investigate the causes of deviations from the planned performance.

Product Development Model



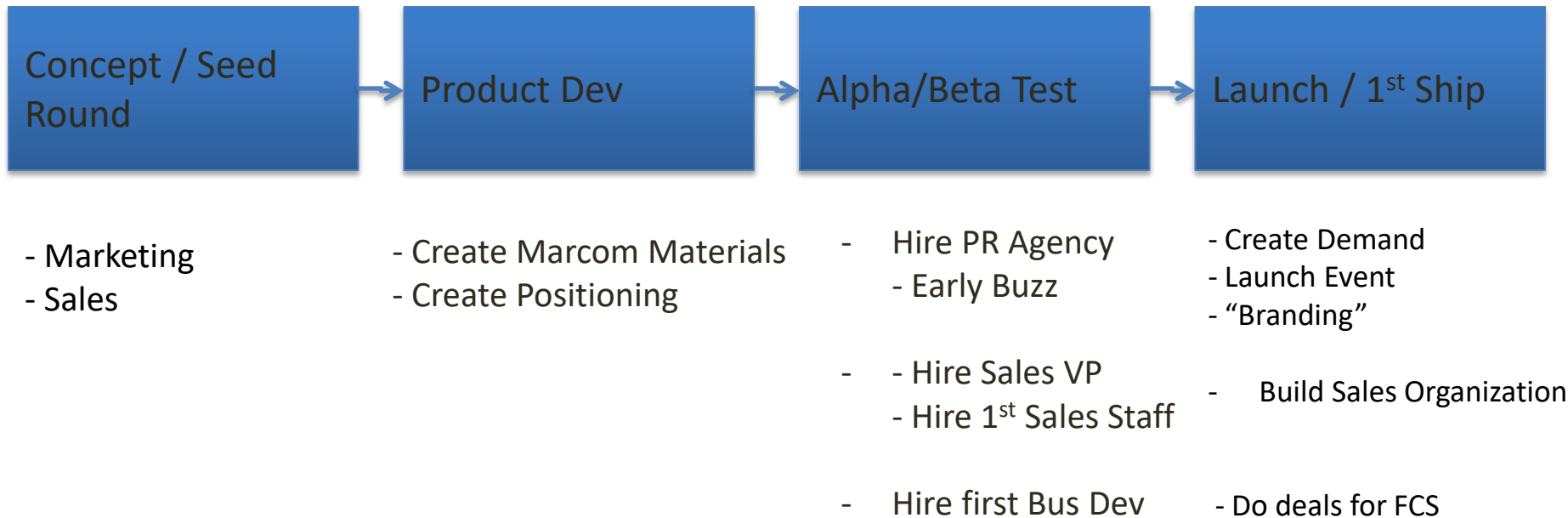
What's Wrong With This?

Product Development



What's Wrong With This?

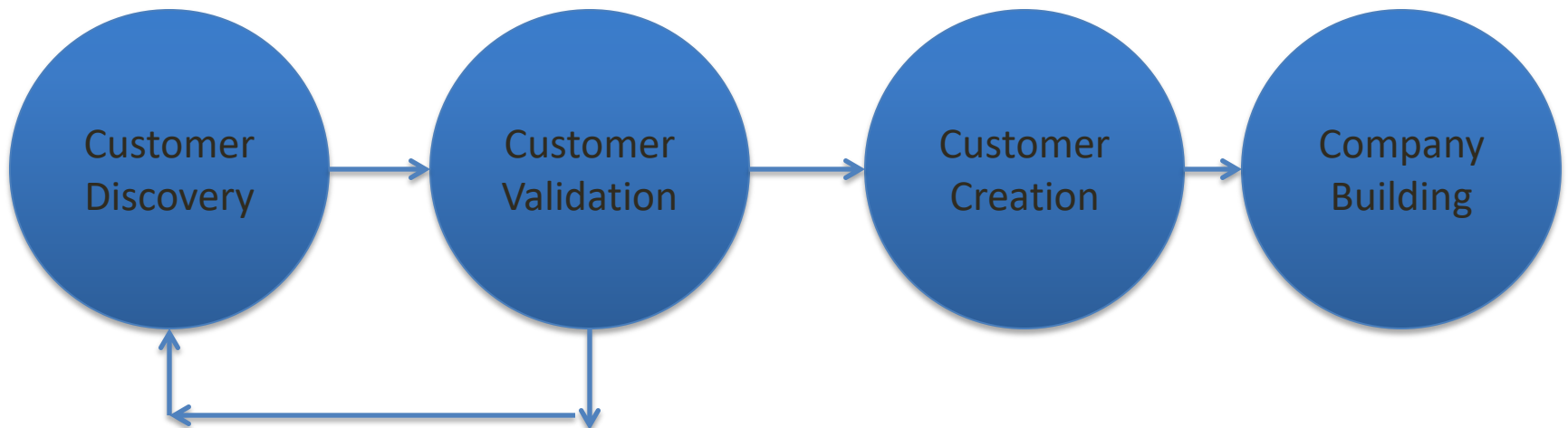
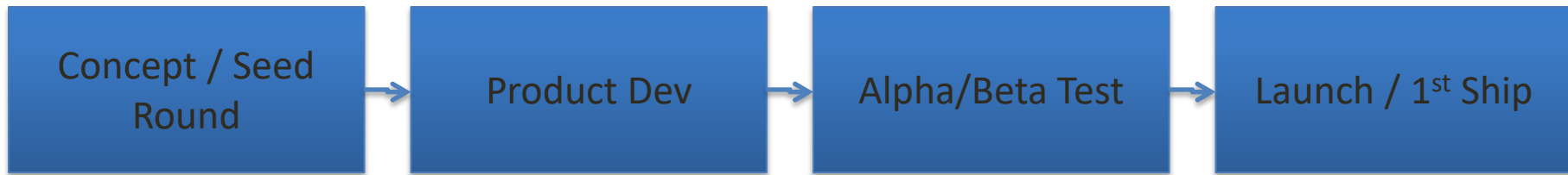
Product Development



Issues with a Product Development Methodology

- 1: Where are the customers?
- 2: The focus on the first customer ship
- 3: Emphasis on execution vs. learning and discovery
- 4: No customer-centric milestones
- 5: Need product dev. To measure sales
- 6: Need product dev. To measure marketing
- 7: Prematurely scaling expenses
- 8: Death spiral
- 9: Three types of startups
- 10: Unrealistic expectations

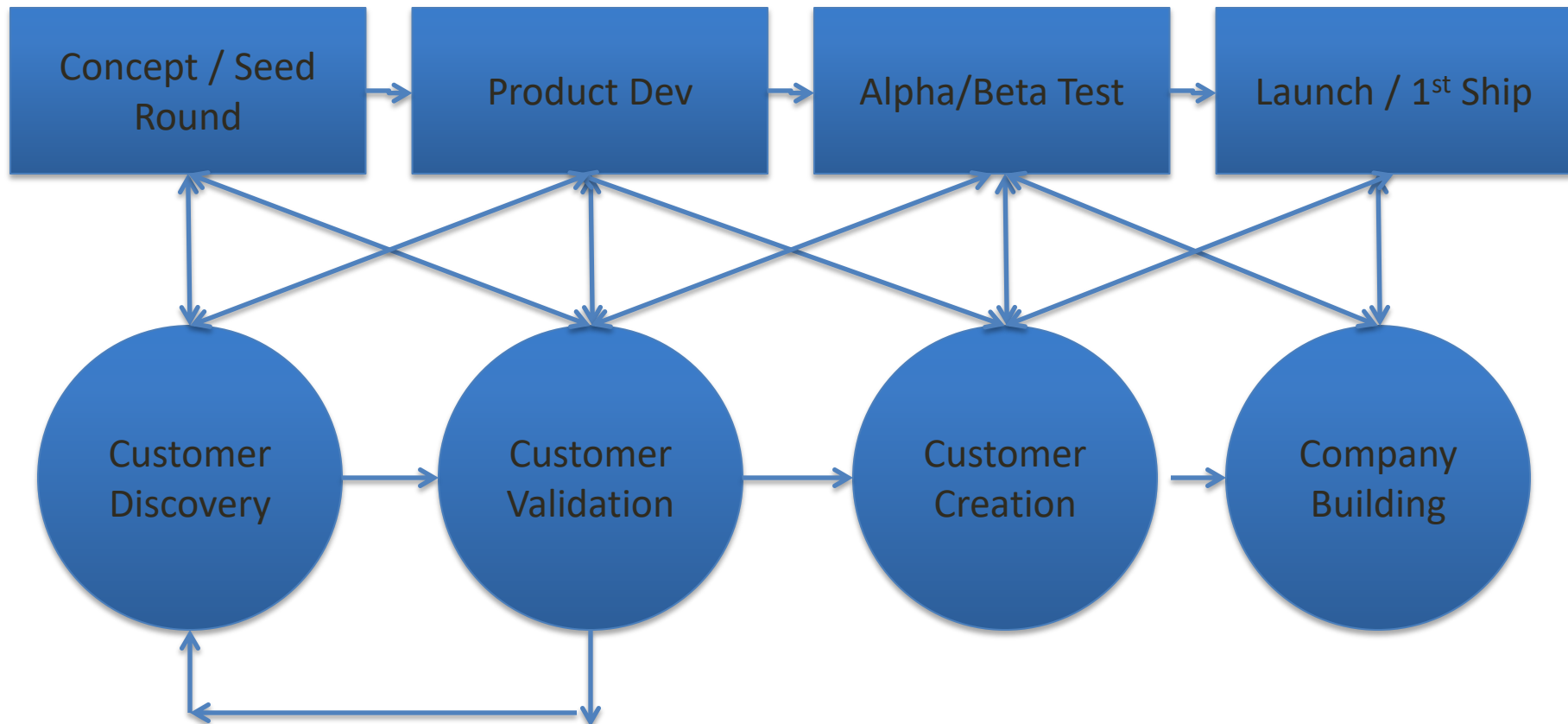
Customer Development is as Important as Product Development



Customer Development Philosophy

- There are no facts inside your building, so get outside the building..!
- Develop for the few, not the many
- Earlyvangelists make your company (and are smarter than you)
- The goal for release 1 is the minimum feature set for Earlyvangelists

Customer and Product Development Synchronization



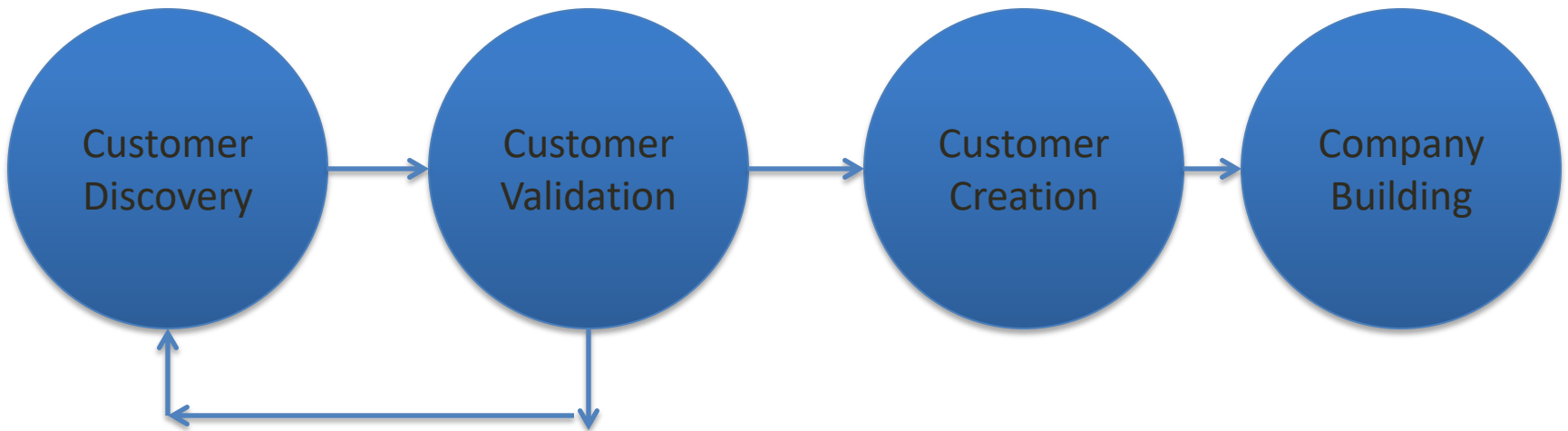
Customer Development: Big Ideas

- Parallel process to Product Development
- Measureable checkpoints for the CEO
- Not tied to the FCS, but to the customer milestones
- Iterative to represent reality
- Executed by a small team including CEO

Agenda

- Startup Hypothesis
- Testing the Problem
- Customer Development Team
- Testing the Product Concept

Timeline



- Existing Market: 1 to 6 months
- Resegmenting: 3 to 12 months
- New Market: 1 to 4 years

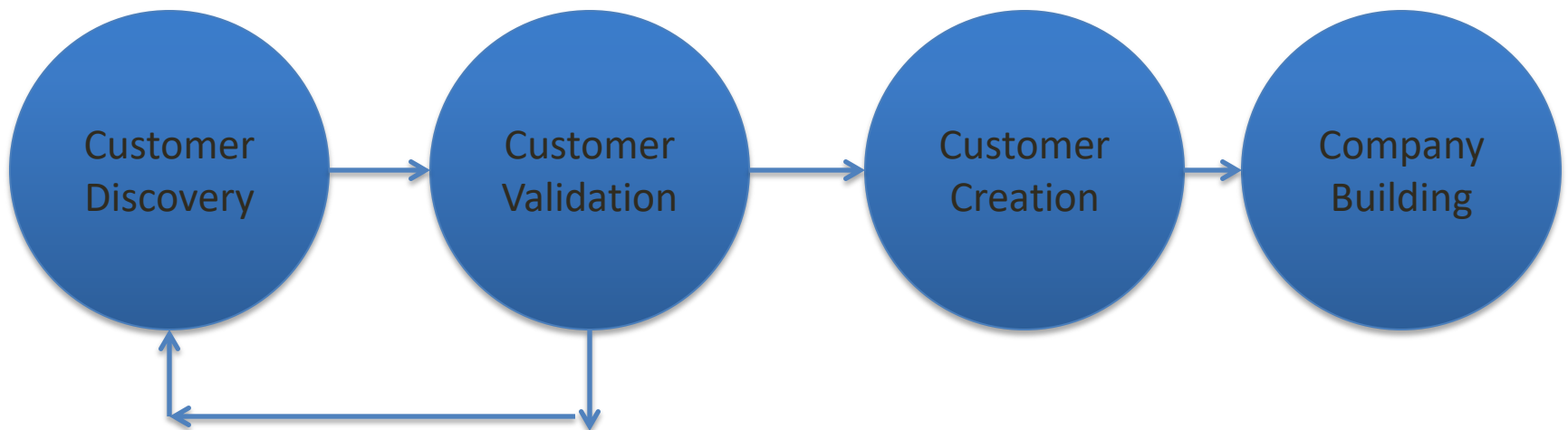
Before You Start

- It's a new philosophy – discover, then build
 - Get Board and Management Buy-In
 - Learning and discovery, before execution
- Customer Development Team
 - Not traditional hires
- Sufficient funding for 2-3 passes

Methodology

- Customer Development can take months or years
- Each step has a set of phases
- Plan what you need to learn in writing so everyone knows:
 - what they should be doing
 - when they should be doing it
 - if they succeeded
 - if they need to do more
- These are checklists, not inviolable commandments

Customer Discovery



- Stop selling, start listening
- Test your two fundamental hypotheses
 - The Problem you're solving (unmet need)
 - The Product Concept

Discovery = Hypothesis Testing

- *What* are Hypothesis?
- *Where* do Hypothesis come from?
- *Why* test them?
- *How* do you test them?

Sources:

- <https://www.slideshare.net/patel9078/production-new-management>
- The four steps to the epiphany: Credits to Steve Blank and Bob Dorf

Thank You

Karen H. Sargsyan