Unit 5
Business models and processes using IoT

Introduction

- IoT has many applications in different domain such as applications/services of RFIDs in logistics, predictive maintenance of railroads , io pipelines, monitoring of transport units in logistics, detecting machine faults in industry, and deploying these IoT based applications and services.
- Industry 4.0 is a new paradigm which will enable intelligent connected manufacturing and will focus on uses of interconnected IoT.
- Business is driving force for growth of industry and technologies.

Terms require to understand for learning business model design, innovation and value creation in business processes

1. **Application or App** means software for application such as software for creating and sending an SMS, measuring and sending the measured data. Application means application software. App is the abbreviation popular for application in the device whenever only one specific task is executed following user interactions.
2. **Service** means a mechanism, which enables the provisioning of access to one or more capability is consistent with the constraints and policies, specified by a service description.
3. **Business Intelligence(BI)** is a process that enables a business service to extract new facts and knowledge , and then undertake better decisions. The new facts and knowledge follow from the earlier results of data processing , aggregation and then analysing those results.
4. **Business process(BP)** is an activity or series of activities or a collection of inter-related structured activities, task or processes. A BP serves a particular goal or specific result or service or product. The BP is a representation or process matrix or flowchart of a sequence of activities with interleaving decision points.

Terms require to understand for learning business model design, innovation and value creation in business processes

- **Distributed BP(DBP)** is a collection of logically interrelated business processes. DBP reduces the complexity and communication costs, and enables faster Reponses and smaller processing load at the central BP system.
- **DBP** is similar to the distribution of control processes for each group of lights at the gateway itself with reduced complexity, communication costs, faster responses and smaller processing load at the central system of lighting control.
- **DBP management** is management of DBPs in an enterprise network.
- **BPs integration** is integration of BPs to reduce the complexity and communication costs, and enable faster Reponses and smaller processing load at the central BP system.

5.1

Business models and innovations

Business models

- Business models continue to grow and innovate since ancient times.
- A business model now a days takes into account many factors , such as competitive advantage, experience curves, value chain, theory of portfolio of products and services, core competencies of business organisation and generic strategies.
- Portfolio means mix of two or more products or services.
- For example, producing watches and jewellery studded watches of simple to sophisticated designs.
- A business model can be defined as a conceptual structure supporting the viability of a business, including its purpose, its goals and its ongoing plans for achieving them.

Business models

- A business model can be defined as abstract representation of an organisation and this representation may be conceptual, textual, and/or graphical.
- Representation is for the all the core inter-related architectural, co-operational and financial arrangements. Architecture includes organisational infrastructure and technological architecture. Representation includes many activities of present and future, and core products and/or services the organisation offers.
- The term ‘business model’ refers to ‘ uses of range of informal and formal descriptions to represent core aspects of a business , business process , strategy, practices and operational processes and policies including culture.
- A business model may focus not only on financial goals but also on the business sustainability or establishing a corporate culture when offering value to customers.

Working on a business model

- Documentation for a business model has many benefits, such as maintaining a focus on corporate goals and reviewing operational practices.
- A popular way of generating or working on a business model is using a canvas which is a visual template for developing new or documenting existing business model.
- The canvas is a single reference model. Its basis is conceptualisation similarities of a wide range of business models.

Business model Canvas

A 'Business Model Canvas' is a visual chart with elements. The elements describe the companies or organisations product's value proposition, infrastructure, customers and finances. Figure 11.1 shows nine building blocks of this canvas.

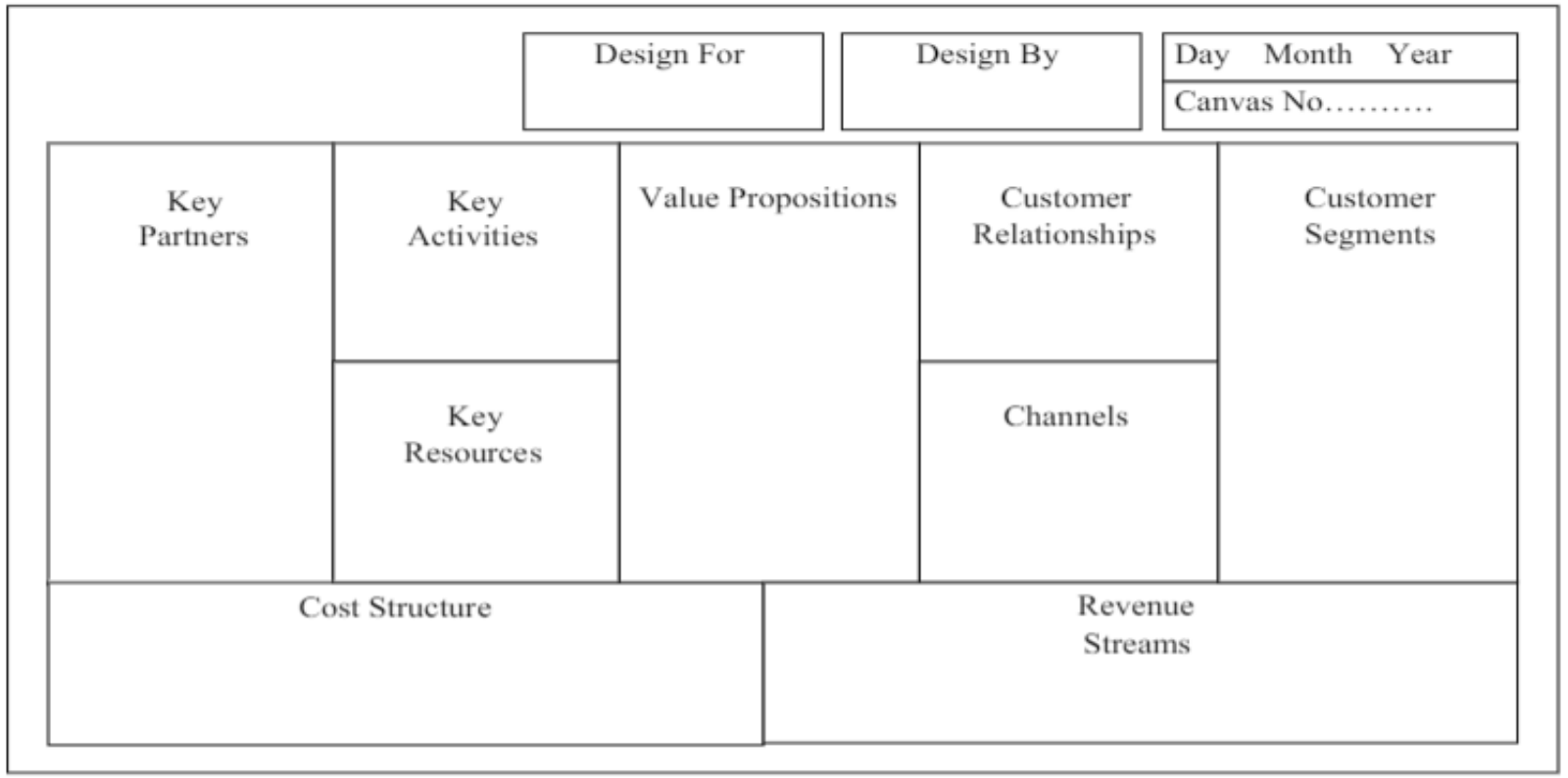

Figure 11.1 Nine building blocks of a business model canvas

Business Model Canvas

- Osterwalder business model canvas has nine business model building blocks.
- Three building blocks are for business infrastructure which consist of:

1. **Key partners**: Strategic alliances between competitors or non-competitors to optimise the operations and reduce risks of a business model.
2. **Key activities:** key activities to execute a company's value proposition
3. **Key resources:** key resources for sustaining and supporting the business, and necessary for creation of value to customers. Example of resources are financial, physical , human and intellectual, customer segments, platforms, markets and diversifications of innovative products.

Business Model Canvas

- Four building blocks are business offering which consist of:

1. **Value propositions:** products and services offered, their features such as performance, efficiency, accessibility, price, cost, convenience , usability and design and how they differ from competitors fall in this category.
2. **Customer relationships:** identified type of relationship of the company to be created with their customers and targeted segments.
3. **Customer segments:** identified sets of customers, segments, client groups and diverse groups based on the value propositions offered.
4. **Channels:** Effective, fast, efficient and cost-effective channels to deliver value proposition to its targeted customers.

Business Model Canvas

- Two building blocks are for business finances which consist of:

1. **Cost structure:** Cost constituents, such as the input raw material, manufacturing, maintenance, packaging ,logistics, machinery replacement, to be considered in offering the value propositions and services, and considerations of scopes of economies in the operations.
2. **Revenue stream:** identified types of income sources, such as income from sales of product and physical goods, usage charges for the services, charges for subscription, sales income , service usage charges, subscription charges, relationship of the company to be created with their customers and targeted segments.

Business Model Canvas

1. Large surface printed sheet to enable sketching, creativity, analysis, understanding or discussion on business model elements.
2. Web-based interface for canvas where the entries of elements can be made and creative suggestions can be placed, understanding can be obtained, analysis can be done or discussion on business model elements can be done.

Business Model

- **Subscription Business model:** one business model is subscription business model. A customer pays for accessing the service or product at periodic intervals. For example , internet data services, cloud platform services, data services etc.
- **Customisation Business model:** one business model is customisation business model. Each customer pays for customisation of a product/service.

Business model innovation

- Business model innovation is the development of new and unique concepts supporting an organization’s financial viability, including its mission , and the processes for bringing those concepts.
- The primary goal of business model innovation is to realise new revenue sources by improving product value, and how the products are delivered to customers.

Business model innovation

- A business model needs innovation because:

❑ **New access path** to business and direct interaction with the customers have come into existence. The access has become fast and easy.

❑ **Direct interactions** at lower costs require modifications in marketing channels deployed earlier to reach customers. Customers also have faster and multichannel information access and better search options.

❑**Business transactions** have become easier and partly automated. Information about customers has become a valuable asset.

❑**New price** models need to be worked out in new competitive environment with wider use of ICT.

❑ **Decentralised models** with the customer at the centre stage are building up and therefore, business models have to be customer-centric.

❑ **Faster introduction of new products and new portfolio strategies** due to better search options with the customers.

Business model innovation

- Business model innovation is becoming a decisive factor for successful business.
- **Five innovation drivers are:**

1. Customer neighbourhood production units for fast deliveries and local sales , and customer involvement from the beginning.
2. Revenues from new sales instead of maintenance
3. Decentralised production and service.
4. Client contribution, open-source design and procurement
5. Significantly reduced capital expenditure

Value creation in the internet of things

- Value proposition means producing product or provisioning of a platform or service. For example, using RFIDs in tracking service for the goods is a value proposition.
- Value creation means creation of a ‘smart tracking and logistics service’ from the sensed IDs of the RFIDs communication on internet, data analytics, data visualisations and mobile communication for provisional for SMS to receiver and delivery confirmation to the sender.
- Value creation is the expansion of relationships enabled by a disruptor media(internet) and the creation of new behaviours as a result.
- Value creation is the heart of any business model. It involves performing activities that enhance the value of a company’s product or service and encourages customer willingness to pay.

Value creation in the internet of things

- **Features of value creation using IoT are:**
- IoT enables addressing the emergent needs and real-time needs using predictive analytics.
- Information convergence creates new experiences for current products. Information enables innovative services.
- IoT enables offering of product and services which can be updated using the internet and create value for the product.
- IoT enables value capture and thus recurrent revenue.
- Adds personalisation and context , and uses networked products/services.
- Faster ecosystem functioning where multiple companies establish loose relationships among themselves or establish relationships with big companies.

Value creation in the internet of things

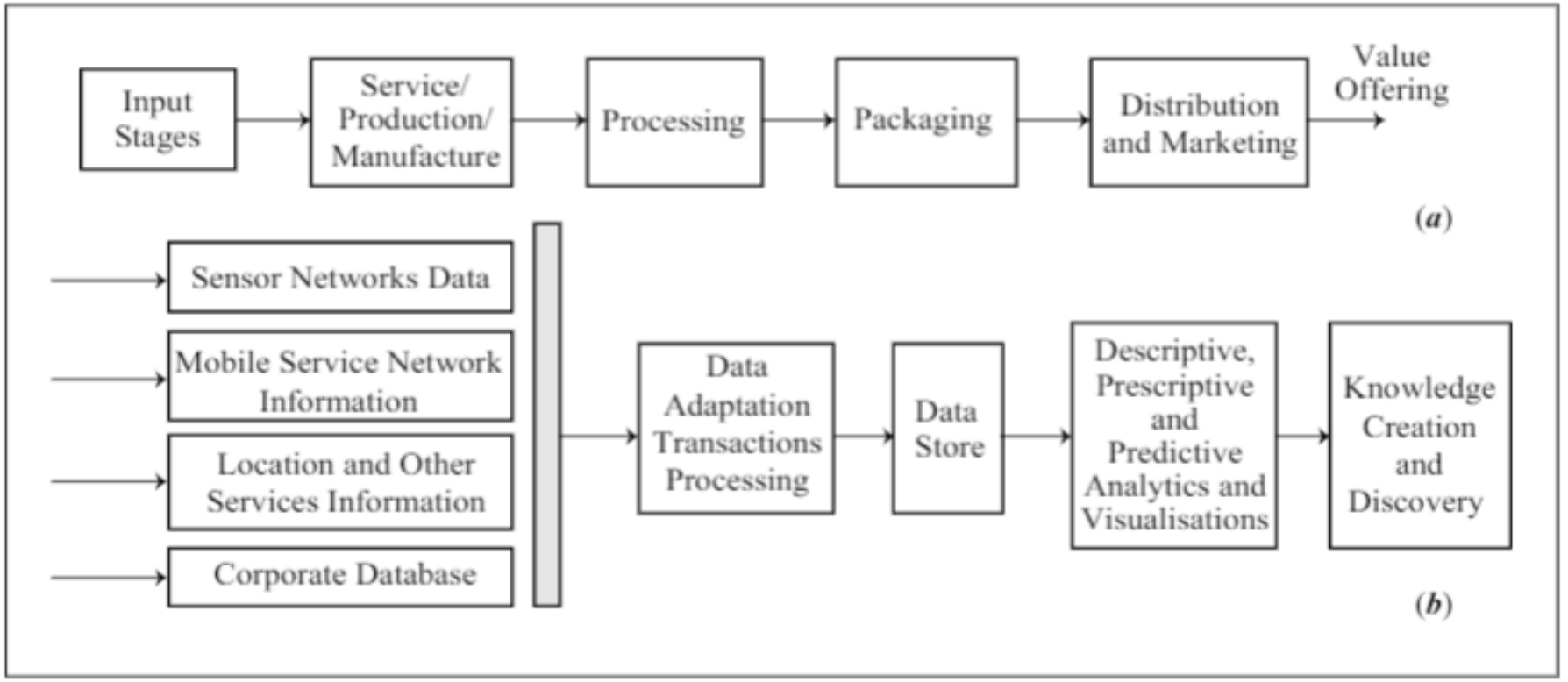

Figure 11.5 (a) Value proposition in production/manufacture-driven value chain (b) Value creation using information-driven IoT value chain in production/manufacture-driven value chain

Value creation in the internet of things1

- Value chain means series of actions for value creation. The base of IoT value chain is data collected using APIs for the sensors/sensor networks/M2M data or from multiple information sources.
- The chain includes actions using web APIs, open data , data from mobile-services network and corporate databases.

Business Model Scenarios for internet of things

- Sensors,M2M , sensor networks data and the data using web APIs for multiple information sources data, open data, mobile services network information data, corporate database and knowledge database are at the input stages.
- The data from multiple sources and services are part of the key resources in business model scenarios for IoT.
- Real-time monitoring applications are used in maintenance scheduling , predictive maintenance , or in fault or anomaly detection.
- Real-time M2M,IoT sensors and sensors network data can be used to generate events and monitor the systems.
- Real-time anomalies and fault detection are possible during the service, production or maintenance. This efficient processes and streamlines existing business processes.

Business Model Scenarios for internet of things

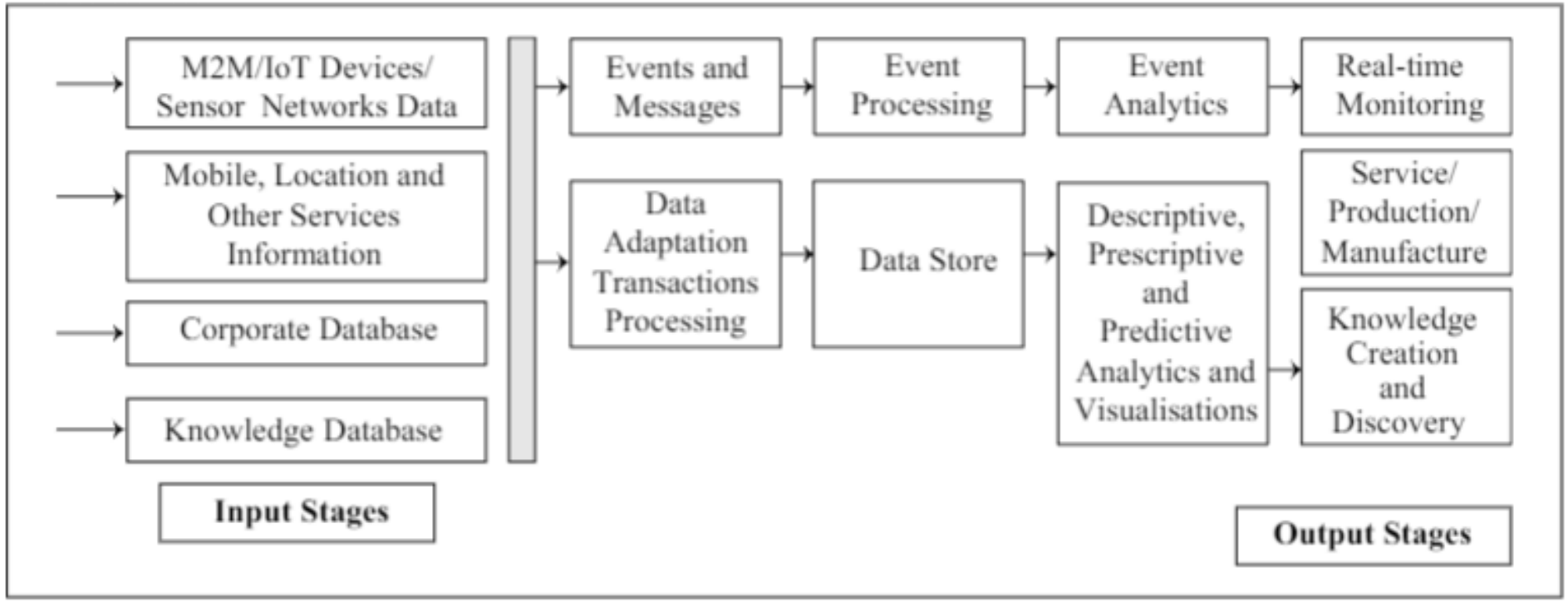

Figure 11.6 Real-time monitoring scenario in maintenance scheduling, predictive maintenance, or in fault or anomaly detection in real-time using IoT