**Business Understanding**

**Instructions:**

Please share your answers filled in-line in the word document. Submit code separately wherever applicable.

Please ensure you update all the details:

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**Topic: Business Understanding**

**Instructions:** Learn to understand the business objective(s) and constraint(s) based on the business problem statements. You should identify and frame statements using the words “maximize” and/or “minimize” for objective(s) and constraint(s) (for example: “maximize profit” “minimize risk”, etc.)

Q1. For the below listed business problems, draft the business objectives and constraints.

**Hint:**

* Objective(s) implies the goals to be achieved in terms of maximizing & minimizing.
* Constraint(s) are the challenges/limitations in achieving the objectives.

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| **S.no** | **Business Problem** |
| **Hint:** | Smart data platforms can bring together customer transactions data and data from real-time communication streams to disclose the insights concerning customers feelings about the services which allows addressing the satisfaction-related issues and churn prevention.  **Sol: Hint**  Business Objective:  Minimize: Churn rate (churning implies customers going to another company for their needs)  (or)  Maximize: Customer satisfaction (satisfaction will make customer more loyal to the brand)  Business Constraints: Lack of data coverage for all customers |
| 1 | Advanced targeting allows predicting needs, preferences, and customers’ reaction to the telecommunication services and products on offer by segmenting their market and targeting the content according to each group.  Business Objective:  Maximize: Conversion rates from promotional offers.  Minimize: Time taken to respond to changing customer needs.  Business Constraints: Limited availability of high-quality, recent customer data. |
| 2 | Telecommunication companies tend to regard the customers’ engagement process and internal channels as a guarantee of smooth functioning of the operations. Network management and optimization gives an opportunity to identify the root causes.  Business Objective:  Minimize: Network downtime, service interruptions, operational costs, and customer complaints.  Maximize: Network reliability, service quality (QoS), operational efficiency, and customer satisfaction.  Business Constraints: Compliance with telecom regulations, budget limitations, technical infrastructure capacity, availability of skilled workforce, and need for timely fault detection and resolution. |
| 3 | Ensuring the high-quality performance of the product according to the customer’s requirement is not possible without applying smart data solutions.  Business Objective:  **Minimize:** Product defects, production errors, rework costs, and customer complaints.  **Maximize:** Product quality, customer satisfaction, operational efficiency, and compliance with customer requirements.  **Business Constraints:** Availability and accuracy of data, budget limitations, compliance with industry standards, integration with existing systems, and timely implementation of quality improvements. |
| 4 | Collection of positive & negative reactions to the service or product from social media sources, recent trends via customer sentiment analysis may provide an opportunity to utilize mechanisms for direct responding.  Business Objective:  **Minimize:** Negative sentiment and delayed responses.    **Maximize:** Positive sentiment and customer engagement.  **Business Constraints:** Data privacy, analysis accuracy, and real-time processing. |
| 5 | Acquiring as many subscribers as possible remains a critical goal. In recent years, the number of users has been growing extremely fast and pricing emerged as a tool to limit congestion and increase revenue at the same time.  Business Objective:  **Maximize:** Subscriber base and revenue.  **Minimize:** Network congestion and churn.  **Business Constraints:** Pricing limits, network capacity, and regulatory compliance. |
| 6 | Customers usually search for better & cheaper services so the telecommunication companies measure, manage, and predict the customer lifetime value (CLV). Smart solutions process real-time insights based on customer purchasing behavior, activity, services utilized, and average customer value.  Business Objective:  **Maximize:** Customer lifetime value and retention.  **Minimize:** Churn and acquisition costs.  **Business Constraints:** Data accuracy, privacy compliance, and real-time processing. |
| 7 | In telecommunications, companies prevent bypass fraud by using big data to review the source of transactions, the cost of the call, and the destination number, in real-world situations.  Business Objective:  **Maximize:** Fraud detection accuracy and revenue protection.  **Minimize:** Bypass fraud losses.  **Business Constraints:** Real-time monitoring, data privacy, and system scalability. |
| 8 | Identify security issues, conduct predictive analysis, and use machine learning-based solutions to analyze any patterns of threats and automated escalations to resolve issues before they cause serious damage.  Business Objective:  **Maximize:** Threat detection accuracy and proactive issue resolution.  **Minimize:** Security breaches and downtime.  **Business Constraints:** Real-time analysis, data privacy, and system reliability. |
| 9 | Retail industry uses AI systems with built-in machine learning algorithms to collect and analyze data regarding products, transactions, etc. Based on findings from data, systems estimate the best strategies that can be implemented for the profit of the business  Business Objective:  **Maximize:** Business profit and sales efficiency.  **Minimize:** Operational costs and inventory waste.  **Business Constraints:** Data accuracy, system integration, and budget limits. |
| 10 | The price determination process depends not only on the costs to produce an item but on the wallet of a typical customer and the competitors' offers. The tools for data analysis bring this issue to a new level of its approach.  Business Objective:  **Maximize:** Pricing accuracy and competitiveness.  **Minimize:** Pricing errors and revenue loss.  **Business Constraints:** Market data availability, competitor analysis, and demand fluctuations. |
| 11 | Inventory deals with stocking goods for their future use. Inventory management refers to stocking goods to use in times of crisis. The retailers aim to provide the right product at the right time in the proper condition.  Business Objective:  **Maximize:** Product availability and customer satisfaction.  **Minimize:** Stockouts and excess inventory.  **Business Constraints:** Storage capacity, demand forecasting accuracy, and supply chain reliability. |
| 12 | Customer feedback is taken as an important aspect of the retail store. Considering customer feedback and making changes can increase the store profits and customer satisfaction.  Business Objective:  **Maximize:** Customer satisfaction and store profits.  **Minimize:** Negative feedback and service issues.  **Business Constraints:** Feedback accuracy, implementation cost, and response time. |
| 13 | Businesses have to be extremely cautious about choosing a new store's location. To make such a decision, a great deal of study regarding the location is required which gives us a basis for understanding the potential of the market. Also, special settings concerning the location of other stores are considered.  Business Objective:  **Maximize:** Store profitability and market potential.  **Minimize:** Location-related risks and operational costs.  **Business Constraints:** Real estate costs, competitor presence, and demographic suitability. |
| 14 | Airlines use AI systems with built-in machine learning algorithms to collect and analyze flight data regarding each route distance, altitudes, aircraft type, weight, weather, etc. Based on findings from the data, systems estimate the optimal amount of fuel needed for a flight.  Business Objective:  **Maximize:** Fuel efficiency and cost savings.  **Minimize:** Fuel waste and operational costs.  **Business Constraints:** Weather variability, data accuracy, and safety regulations. |
| 15 | Airlines and flight operators can significantly reduce their operational costs and overhead by optimizing their sales revenue in the longer term with AI-powered systems (dynamic pricing)  Business Objective:  **Maximize:** Sales revenue and pricing efficiency.  **Minimize:** Revenue loss and pricing errors.  **Business Constraints:** Market demand fluctuations, competitor pricing, and regulatory compliance. |
| 16 | As flight delays are dependent on a huge number of factors, an intelligent system can be applied to analyze huge datasets in real time to predict delays and re-book customers’ flights in time.  Business Objective:  **Maximize:** On-time performance and customer satisfaction.  **Minimize:** Flight delays and rebooking disruptions.  **Business Constraints:** Real-time data processing, weather uncertainties, and operational constraints. |
| 17 | By analyzing specific customer’s flight and purchase patterns, and coupling it with historic data, algorithms are able to point out suspicious credit card transactions and detect fraudulent cases thereby saving airline and travel companies millions of dollars every year.  Business Objective:  **Maximize:** Fraud detection accuracy and revenue protection.  **Minimize:** Financial losses from fraudulent transactions.  **Business Constraints:** Real-time detection, data privacy compliance, and false positive reduction. |
| 18 | What is the optimal way to schedule an airline’s crew to maximize their productive time and balance their working hours to increase employee retention?  Business Objective:  **Maximize:** Crew productivity and employee retention.  **Minimize:** Scheduling conflicts and overtime costs.  **Business Constraints:** Labor regulations, crew availability, and flight schedules. |
| 19 | The image of the enterprise in the community largely influences the recruitment process. A person may not be interested in applying for a job in an enterprise whose goodwill is low.  Business Objective:  **Maximize:** Employer brand value and applicant quality.  **Minimize:** Negative public perception and recruitment challenges.  **Business Constraints:** Public relations strategy, budget limits, and community engagement. |
| 20 | If the job is boring, hazardous, tension ridden, and lacking in opportunities for advancement, very few people may be available for such jobs.  Business Objective:  **Maximize:** Job attractiveness and employee satisfaction.  **Minimize:** Workplace hazards and employee turnover.  **Business Constraints:** Safety regulations, job design limitations, and training costs. |
| 21 | One of the greatest challenges that an HR leader could face is keeping the staff satisfied.  Business Objective:  **Maximize:** Employee satisfaction and retention.  **Minimize:** Workplace conflicts and turnover rates.  **Business Constraints:** Budget for benefits, organizational policies, and resource availability. |
| 22 | Organizations face huge costs resulting from employee turnover. Some costs are tangible such as training expenses and the time it takes from when an employee starts to when they become a productive member.  Business Objective:  **Maximize:** Employee retention and productivity.  **Minimize:** Turnover costs and training time.  **Business Constraints:** Budget limits, hiring timelines, and training resources. |
| 23 | Attracting the attention of a candidate and driving the traffic towards a company’s hiring page is one place where an AI can see widespread use.  Business Objective:  **Maximize:** Candidate engagement and application rates.  **Minimize:** Recruitment marketing costs and irrelevant applications.  **Business Constraints:** Budget limits, targeting accuracy, and platform policies. |
| 24 | HR departments are responsible for the implementation of training programs. Some of these programs are designed to ensure your staff follows policies and procedures while others are used for job advancement. In some job settings, employees are required to complete certain certification programs.  Business Objective:  **Maximize:** Training effectiveness and employee skill development.  **Minimize:** Non-compliance and skill gaps.  **Business Constraints:** Budget limits, time availability, and certification requirements. |
| 25 | Understanding people and why they decide to stay at or leave a job is arguably one of the most important questions for HR to answer. Identifying attrition risk calls for advanced pattern recognition in surveying an array of variables.  Business Objective:  **Maximize:** Employee retention and predictive accuracy of attrition models.  **Minimize:** Turnover rates and associated costs.  **Business Constraints:** Data privacy, model accuracy, and timely intervention. |
| 26 | Your HR department likely deals with many requests and queries from employees throughout the day. This could include queries about available time off, vacation time, or HR issues with their paycheck. They may also receive requests for shift swaps and other scheduling problems.  Business Objective:  **Maximize:** Response efficiency and employee satisfaction.  **Minimize:** Resolution time and administrative workload.  **Business Constraints:** System capacity, policy compliance, and resource availability. |
| 27 | In modern manufacturing, production can often depend on a few critical machines or cells. The same data that provides a manufacturer real-time monitoring can be analyzed through data science to improve asset management and prevent machine failure.  Business Objective:  **Maximize:** Equipment uptime and asset utilization.  **Minimize:** Machine failures and maintenance costs.  **Business Constraints:** Data accuracy, maintenance budget, and system integration. |
| 28 | Plan to help manufacturers analyze if their product and services are meeting all objectives for initial processes such as the DMAIC framework. They need a strategy to be used to determine which product has the highest impact. Helping in minimizing errors and losses and eliminating unnecessary human effort can increase the overall quality of products and services.  Business Objective:  **Maximize:** Product quality and process efficiency.  **Minimize:** Errors, losses, and unnecessary human effort.  **Business Constraints:** Data availability, process complexity, and resource limitations. |
| 29 | Some flaws in products are too small to be noticed by the naked eye even if the inspector is very experienced. The time taken for inspection also slows down the production.  Business Objective:  **Maximize:** Inspection accuracy and production speed.  **Minimize:** Undetected defects and inspection time.  **Business Constraints:** Technology cost, system integration, and staff training. |
| 30 | A business wants to make design enhancements/upgrades to the current version of the product to increase consumption of the product and thereby the brand image. They need to identify the features which most of the customers use and they need to understand customer behavior towards the product, brand, and their interests.  Business Objective:  **Maximize:** Product adoption and brand image.  **Minimize:** Unused features and customer dissatisfaction.  **Business Constraints:** Data accuracy, budget limits, and market research timelines. |
| 31 | For many contract manufacturers, product development is part of the service they provide so having data to validate their choices to their customer is crucial. To validate the choices, they need to depend on a wide range of factors such as value for money, quality, reliability, and service. It is crucial to gather such data.  Business Objective:  **Maximize:** Product quality validation and customer satisfaction.  **Minimize:** Development errors and poor design choices.  **Business Constraints:** Data availability, analysis accuracy, and project timelines. |
| 32 | Manufacturers are able to detect all kinds of issues on their routine methods of production, from bottlenecks to unprofitable production lines. Companies are taking a deeper look into their logistics, inventory, assets, and supply chain management. The insights will bring high-value insights that uncover potential opportunities not just in the manufacturing process but also in the packaging and distribution.  Business Objective:  **Maximize:** Operational efficiency and supply chain optimization. **Minimize:** Bottlenecks and unprofitable production lines. **Business Constraints:** Data integration, resource availability, and implementation cost. |
| 33 | The Department of Employment, Skills and Small Business carries out research to identify skill shortages in the labor market. Factors for skilled labor shortage analysis are adequate availability of vacancy, job postings and recruitments, applicants’ qualifications for the job, factors affecting the position to be filled, such as required licensing requirements, qualification and experience requirements are few of those constraints that should be considered.  Business Objective:  **Maximize:** Skilled labor availability and job placement efficiency.  **Minimize:** Skill shortages and unfilled vacancies.  **Business Constraints:** Licensing requirements, qualification criteria, and market conditions. |
| 34 | The world is constantly changing. Thus, the sports industry is faced with the challenge of trying to predict the next trend, the next big idea that will capture their audience. Coupling this challenge with that of technology, it’s clear that some sports teams and venues will always be at odds.  Business Objective:  **Maximize:** Audience engagement and trend adoption.  **Minimize:** Missed opportunities and outdated offerings.  **Business Constraints:** Technology adoption, market unpredictability, and budget limits. |
| 35 | Betting companies analyze the massive amounts of data generated by sporting events all around the world to come up with probabilities for future outcomes. Goes without saying that predictive modelling using machine learning techniques plays an important role in this.  Business Objective:  **Maximize:** Prediction accuracy and betting profitability. **Minimize:** Forecasting errors and financial losses. **Business Constraints:** Data quality, model reliability, and regulatory compliance. |
| 36 | Stadium management and sponsors have studied the average profile of their audience carefully and have made targeted advertisements that appeal to their audiences. The broadcasters and stadium management have placed those ads carefully after conducting a careful analysis of its own resources for maximum impact.  Business Objective:  **Maximize:** Ad effectiveness and audience engagement. **Minimize:** Irrelevant advertising and wasted resources. **Business Constraints:** Audience data accuracy, budget limits, and ad placement opportunities. |