# Section 1 – Description of Project Idea

**Purpose:**

This application serves as a resource management tool that streamlines a few work processes in a manufacturing environment. The primary aim is to make sure all tasks have adequate resources allocated to it and it can be completed before a stipulated deadline. In the long run, the tool also serves as a resource planner, which tracks future resource levels versus the amount of scheduled work. The main functionalities are listed below:

1. Tracking of employee changes through Create and Delete Function
2. Tracking of employee competency as employees work on Jobs/Task
3. Scheduling Jobs/Task with a required Start date and Completion by date
4. Comparing available employees to resource required by Jobs/Task
5. Generating Key Performance Indicators for a selected time-period
6. Downloading of data from the application to .csv format

Using the computational problem-solving process, it will help improve productivity and reduces error by being able to provide these work processes in one application, instead of the status quo (i.e multiple interlinked excel sheets to track, calculate and generate reports).

**Overview:**

Key library dependencies (Preliminary):

1. csv 🡪 To import csv files as an alternative to an actual database
2. datetime 🡪 For date and time manipulation for effective scheduling
3. calendar 🡪 For manipulation of days, months and years

This application will preliminary have 4 to 5 options for the user to select:

Option 1: Load database

* Serves as an alternative to an actual database connection

Option 2: Update employee records/Update Task

* To add and remove employees due to hiring/attritions respectively
* To update/reschedule task in the event of employee changes

Option 3: Schedule Jobs/Task

* During job scheduling, application will check required resource of job vs available resource, if insufficient, an alert will be raised, else the job will be accepted

Option 4: Calculate Key Performance Indicators

* Total cost spent on task for a time period
* Total resource usage for a time period
* Attrition/New hiring levels in the company

Option 5: Download Data (possible to incorporate within the 4 Options as well)

* Serves as an alternative to an actual database connection (data persistence)

# Section 2 – Preliminary Use Cases

|  |  |  |
| --- | --- | --- |
| **S/N** | **Use Case** | **Use Case Description/Business Rules** |
| 1 | Update of Resource | * Updating of “database” when a new employee is hired or when an employee leaves the company, through Employee ID, First name and Last name   Sample Input:  Input: [Employee ID, First Name, Last Name, Competency]   * If attrition happens, programme should alert user of all current jobs affected due to this resignation * To allow jobs to be planned if there is sufficient resource, else an alert will be raised |
| 2 | Update of Task | * To update/reschedule task in the event of employee changes |
| 3 | Scheduling of Job/Task | * Provides the user an ability to schedule job and have an overview of what jobs is required to be completed at a certain time   Sample Input:  Input: [Job Name, Start Date, Completion by Date, Total Cost, Resource Required]   * The Job scheduler should take into consideration:  1. Available resource 2. Job Required start and Completion date |
| 4 | Calculation of Key Performance Indicators (KPI) | * Provides business leaders in the company to calculate monthly/Year-to-date performances such as total spend on jobs, resource usage levels etc. * Calculation of attrition and new hiring levels in the company for better Human resource management |
| 5 | Tracking of Resource competency | * Provides business leaders a view on the areas of development required for their company by tracking the change in competency levels of their employees   Sample Output:  Output: [Employee ID, Competency level]   * Employees will have an instance attribute that will be updated as more time is spent on jobs |
| 6 | Download database | * Provides ability to download current planned jobs * Provides ability to download current employees * Provides ability to download KPIs   Sample Outputs:  Output: A .csv file with the required columns (e.g.) for Planned Jobs: [Job Name, Start Date, Completion by Date, Total Cost, Resource Required] |