**Appendix 1**

The following major key performance indicators (KPI) were considered during the ideation process of the P.A.C.E. Service:

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| 1. Reduce Recycle and Reuse KPIs | 1. Growth Model KPIs | 1. Viability KPIs |
| 1. Information Technology KPIs | 1. Customer Service KPIs |  |

| Table . Proposed Reduce Recycle and Reuse KPIs Used in PACE Service | | | | | |
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| **Key Performance Indicator (KPI)** | **Objective** | **Formula** | **Data Required** | **Source** | **Intended User of KPI** |
| 1. **Reduce Recycle and Reuse KPIs** | | | | | |
| 1.1 Recycle Rate | To measure the proportion of waste that is effectively recycled, indicating the efficiency of the recycling system. |  | * Total Waste Collected from university * Total Recycled Materials from program | * University (Organization) * PACE Database | * University (Organization) * PACE Service |
| 1.2 Waste Diversion Rate | To assess how much waste is being diverted from landfills through recycling, and reuse helping reduce environmental impact. |  | * Total Recycled Waste Diverted by PACE Service * Total Recycled Waste Generated | * PACE Database * University (Organization) | * University (Organization) * PACE Service |
| 1.3 Reduction in Waste Generation | To measure the decrease in overall waste generated over time, reflecting the effectiveness of the "Reduce" aspect of the program. |  | * Baseline Waste * Current Waste | * University (Organization) * University (Organization) | * University (Organization) * PACE Service |
| 1.4 Percentage of Materials Reused | Measure how often materials are reused rather than disposed of, reflecting the success of reuse initiatives. |  | * Total Reused Materials * Total Materials Disposed of or Recycled | * PACE Service | * University (Organization) * PACE Service |
| 1.5 Short term Carbon Emissions Reduction | To track the decrease in carbon emissions due to waste diversion, recycling, and reduced  need for new material production. |  | * emissions factor * quantity of material n | * Online Site * PACE Service | * University (Organization) * PACE Service |
| 1.6 Waste Contamination Rate | To measure how well waste is being properly sorted for recycling, as contamination can  decrease the quality of recycled materials. |  | * Contaminated Waste * Total Waste Collected for Recycling | * PACE Service * PACE Service | * University (Organization) * PACE Service |
| 1.7 Public Participation Rate | To measure the level of community engagement in the recycling program, indicating awareness and involvement in sustainability efforts. |  | * Number of Participants in Program * Total Eligible Population | * University (Organization) * PACE Database | * University (Organization) * PACE Database |
| 1.8 Cost Savings from Recycling and Reuse | To assess the financial benefits achieved through reduced disposal fees, waste management costs, and the use of recycled materials. |  | * Total Cost of Waste Disposal * Total Cost of Recycling and Reuse | * University (Organization) * PACE Database | * University (Organization) * PACE Database |
| 1.9 Total Waste Per Capita | To evaluate individual waste generation, which helps identify areas for improvement in reducing waste at the consumer level. |  | * Number of Participants in Program * Total Eligible Population | * PACE Database * University (Organization) | * University (Organization) * PACE Database |

| Table . Proposed Growth Model KPIs Used in PACE Service | | | | | |
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| **Key Performance Indicator (KPI)** | **Objective** | **Formula** | **Data Required** | **Source** | **Intended User of KPI** |
| 1. **Growth Model KPIs** | | | | | |
| 2.1 New users | Measure users who are experiencing PACE for the first time ever |  | * First time use data | * PACE Database | * PACE Service |
| 2.2 Current users | Measure users active today, who were also active in the past week. |  | * Use data today * Total use data in last week | * PACE Database | * PACE Service |
| 2.3 Reactivated users | Measure learners active today, who were also active in the past month (but not the past week) |  | * Use data today * Total use data in last week * Total use data in past month | * PACE Database | * PACE Service |
| 2.4 Resurrected users | Measure learners active today, who were last active >30 days ago. |  | * Use data today * Total use data in last week * Total use data in past month | * PACE Database | * PACE Service |
| 2.5 At-risk Weekly Active Users | Measure learners who have been active within the past week, but not today. |  | * Use data today * Total use data in last week | * PACE Database | * PACE Service |
| 2.6 At-risk Monthly Active Users | Measure learners who were active within the past month, but not the past week. |  | * Total use data in last week * Total use data in past month | * PACE Database | * PACE Service |
| 2.7 Dormant Users | Measure learners who have been inactive for at least 30 days. |  | * Total use data in past month | * PACE Database | * PACE Service |
| 2.8 Daily active users | Current number of active users per day |  | * New users * Current users * Reactivated users * Resurrected users | * PACE Database | * PACE Service |
| 2.9 Weekly active users | Current number of Weekly Users |  | * New users * Current users * Reactivated users * Resurrected users * At-risk Weekly Active Users | * PACE Database | * PACE Service |
| 2.10 Monthly active users | Current number of Monthly Users |  | * New users * Current users * Reactivated users * Resurrected users * At-risk Weekly Active Users * At-risk Monthly Active Users | * PACE Database | * PACE Service |
| 2.11 Reactivation Rate | Number of users reactivated within given period |  | * Current Reactivated Users * Number of At-risk Monthly Active Users in last period | * PACE Database | * PACE Service |
| 2.12 Resurrection Rate | Number of users reactivated within given period |  | * Current Resurrected Users * Dormant Users | * PACE Database | * PACE Service |

| Table . Proposed Viability KPIs Used in PACE Service | | | | | |
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| **Key Performance Indicator (KPI)** | **Objective** | **Formula** | **Data Required** | **Source** | **Intended User of KPI** |
| 1. **Viability KPIs** | | | | | |
| 3.01 Customer Acquisition Rate (CAR) | This measures how many new customers are acquired from a pool of leads. A higher CAR indicates that the product is appealing to a substantial portion of the market. |  | * Number of New Customers * Total potential Customers | * PACE Database | * PACE Service |
| 3.02 Customer Retention Rate (CRR) | Measures the percentage of customers retained over a specific period. High retention indicates the product is meeting customer expectations and needs. |  | * Customers at End of given Period * New Customers Acquired During period * Customers at Start of Period | * PACE Database | * PACE Service |
| 3.03 Net Promoter Score (NPS) | Measures customer loyalty and likelihood of recommending the product to others. NPS scores can range from -100 to +100, with higher values signalling strong customer satisfaction. |  | * % Promoters * % Detractors | * PACE Database | * PACE Service |
| 3.04 Customer Acquisition Cost (CAC) | The cost associated with acquiring a new customer. If CAC is lower than Customer  Lifetime Value (CLV), the product is deemed cost-effective to market. |  | * Number of Customers Acquired * Total Marketing * Sales Costs | * PACE Database | * PACE Service |
| 3.05 Customer Lifetime Value (CLV) | The total points service is expected to earn from a customer throughout their  relationship with the product. A higher CLV compared to CAC is a sign of long-term profitability. |  | * Average points per transaction * Number of Repeat Transactions * Average Customer Lifespan | * PACE Database | * PACE Service |
| 3.06 Break-even Point (BEP) | The point at which total revenue equals total costs, indicating when the product will begin to generate profit. |  | * Fixed Costs * Price per Unit * Variable Cost per Unit | * PACE Database | * PACE Service |
| 3.07 Conversion Rate | The percentage of visitors or leads who take a desired action, such as making a purchase. High conversion rates indicate the product resonates with potential customers. |  | * Number of Conversions * Number of Website Visitors | * PACE Database | * PACE Service |
| 3.08 Churn Rate | Measures the rate at which customers stop using the product or service. A lower  churn rate indicates high customer satisfaction and product value. |  | * Customers Lost During Period * Customer at Start of Period | * PACE Database | * PACE Service |
| 3.09 Market Share | Measures the proportion of total sales in the market that a product captures. Higher market share can indicate competitive strength and product demand. | OR | * Reduce Reuse Recycle material from PACE * Total Reduce Reuse Recycle material from University | * PACE Database | * PACE Service |
| 3.10 Product-Market Fit (PMF) Score | Typically derived from customer surveys asking how disappointed they would be if the service no longer existed. A PMF score above 40% is often considered a good indicator of market fit. |  | * Number of Customers Who Would Be Very Disappointed * Total Survey Respondents | * PACE Database | * PACE Service |
| 3.11 Active User Growth | Measures the growth rate of active users (daily or monthly). Positive growth indicates a successful adoption of the product or service. |  | * Active Users in Current Period * Active Users in Previous Period * Active Users in Previous Period | * PACE Database | * PACE Service |
| 3.12 Operational Scalability | Assesses how easily the business can expand its operations without proportional increases in cost. A higher ratio suggests that the product can scale effectively. |  | * Current number of Customers * Increased Cost of Expansion | * PACE Database | * PACE Service |

| Table . Proposed Information Technology KPIs Used in PACE Service | | | | | |
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| **Key Performance Indicator (KPI)** | **Objective** | **Formula** | **Data Required** | **Source** | **Intended User of KPI** |
| 1. **Information Technology KPIs** | | | | | |
| 4.01 Total Support Requests | The total number of support requests or issues raised by users or customers over a given period.(Measures volume of support requests). | Sum of all support request during given period | * Sum of all support request during given period | * PACE Database | * PACE Service |
| 4.02 Open Support Requests | The number of support requests that have been raised but not yet resolved ( measures efficiency of the IT support team). | Open support requests = total request raised – Total requests resolved | * Total request raised * Total requests resolved | * PACE Database | * PACE Service |
| 4.03 Request Resolution Time | The average time taken to resolve support request from the moment they are raised to when they are marked as closed. (Measure of the efficiency and responsiveness of the support team). |  | * Total Time Taken to Resolve Request * Total Number of Resolved Request | * PACE Database | * PACE Service |
| 4.04 Average Time between Failures | The average time elapsed between the occurrence of two consecutive failures in the system or service. (Measure system reliability). |  | * Total Time Period * Number of Failures during the period | * PACE Database | * PACE Service |
| 4.05 Average Time to Repair | The average time it takes to fix or repair a system or service after a failure or issue is reported (Measure efficiency of the IT team). |  | * Total Repair Time * Number of Repairs completed | * PACE Database | * PACE Service |
| 4.06 Uptime % | The percentage of time a system, server, or service is fully operational and available for use. (Measure system reliability and availability). |  | * Total Operational Time * Total Time Period | * PACE Database | * PACE Service |
| 4.07 Server Downtime | The amount of time a server is unavailable or non-operational during a specific period (Track the reliability of servers and identify periods of unavailability). | Total time server is unavailability | * Total time server is unavailability | * PACE Database | * PACE Service |
| 4.08 IT Cost vs Total Points Generated | The ratio of IT expenses to the volume of material recycled generated by the company or business. (Analyse the cost-efficiency of IT operations and how well IT spending correlates with service performance.) |  | * IT Cost * Total Point Generated | * PACE Database | * PACE Service |

| Table . Proposed Customer Service KPIs Used in PACE Service | | | | | |
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| **Key Performance Indicator (KPI)** | **Objective** | **Formula** | **Data Required** | **Source** | **Intended User of KPI** |
| 1. **Customer Service KPIs** | | | | | |
| 5.01 Number of Customer Issues | Measures total number of customer service issues or requests, categorized by type to understand distribution of different types of issues customers face, helping to  identify patterns or areas for improvement. | Count of issues by category for given period. | * Count of issues by category for given period | * PACE Database | * PACE Service |
| 5.02 Average Response Time | Measures average time it takes for customer service agents to respond to a customer inquiry after the initial request to gauge the responsiveness of customer service. |  | * Total Time for All Responses * Number of Responses | * PACE Database | * PACE Service |
| 5.03 Average Resolution Time | The average amount of time it takes for an issue to be resolved from the moment it is reported. |  | * Total Time to resolve all Issues * Number of Issues Resolved | * PACE Database | * PACE Service |
| 5.04 Cost per Customer obtained | Average Cost to obtain a customer |  | * Total customer services costs * Total number of customers obtained | * PACE Database | * PACE Service |
| 5.05 Customer Satisfaction /Score | measures the level of satisfaction customers experience after using service |  | * Number of Satisfied Customers * Total Survey Respondents | * PACE Database | * PACE Service |
| 5.06 Positive Customer Reviews | Measures percentage of customer reviews that are positive to gauge brand perception. |  | * Number of Positive Reviews * Total Reviews | * PACE Database | * PACE Service |
| 5.07 Customer Retention Rate | Percentage of customers who continue to do business with company over given period |  | * Number of Customers at the end of period * New Customers * Number of Customers at start of Period | * PACE Database | * PACE Service |
| 5.08 Support Cost per Total Cost Ratio | Measures how much money is spent on customer support issues over total to maintain the service. |  | * Support Cost * Total Cost | * PACE Database | * PACE Service |