K1 Speed:
Indoor Racing Establishment

MIS 306 Spring 2024
Team 13 - Section 2
Jacob Andersen
Michael Marzook
Kyle Murphy
Javier Laguna
Quan Tran

Company Contact Information:
Name: K1 Speed
Phone: (855) 517-7333
Email: K1 Speed Contact Page

Table of Contents

Page

I. Executive Summary……..4
II. Business Analysis Section……5
    A. Enterprise Analysis
        1. Strategic Goals
        2. Our Goals
    B. Business Area Analysis
        1. Problems/ Opportunities / Directives
        2. Baseline and Target Performance Measures
III. Current Business Process Analysis…….8
    A. Process Overview
    B. Physical System Narrative
    C. Summary of Problems and opportunities
IV. Proposed Business Process Analysis…….11
    A. Proposed Technical Solution Discussion
    B. Proposed Physical Process Discussion
V. Solution Assessment Section…….13
    A. How does the solution support the enterprise goals and strategy?
    B. What specific benefits and consequences will the system provide?
    C. Who will benefit or lose from the proposed system, and how?
    D. Feasibility Analyses
        1. Operational Risk
        2. Technical Risk
        3. Financial Risk
        4. Security Risk
VI. Implementation Plan…….17
VII. Conclusion……17
VIII. Exhibits…….20
    A. QLess Walk Through
    B. Current Logical Process Models
        1. Current Logical Context Model
        2. Current Use Case Diagram
        3. Current Logical Functional Decomposition
        4. Current Data Flow Diagram
        5. Current Logical Diagram Level 1 Process 1
    C. Current Level 1 Processes
        1. Level 1 Process 2
        2. Level 1 Process 3

3. Level 1 Process 4
4. Level 1 Process 3.2
5. Level 1 Process 4.2

D. Currently Entity Relationship Diagram
E. Proposed Logical Process Model
    1. Proposed Context Diagram
    2. Proposed Logical Use Case Diagram Level 0
    3. Proposed Logical Functional Decomposition Diagram
    4. Proposed Logical Diagram
F. Proposed Logical Diagram Level 1
    1. Proposed Logical Diagram Level 1 Process 2
    2. Proposed Logical Diagram Level 1 Process 3
    3. Proposed Logical Diagram Level 1 Process 4
    4. Proposed Logical Level 2 Process 3 Diagram
    5. Proposed Logical Diagram Level 2 Process 4
G. Proposed Entity Relationship Diagram
H. Proposed Physical Models
    1. Data Flow Diagram Level 0
    2. Level 1 Process 2
    3. Level 3 Process 3
    4. Level 1 Process 4
I. Proposed Physical Models Level 2
    1. Level 2 Process 3
    2. Level 2 Process 4.1
J. QLess
    1. User Interface
    2. Dashboard
K. PIECES
L. Financial Feasibility Calculations (Excel)

Executive Summary

Although customers generally have a positive experience with K1 Speed, its popularity has caused longer wait times, leaving some racers unsatisfied with the level of customer management. The manager of the Carlsbad location, Frankie Zeigler, has expressed interest in increasing customer satisfaction, reducing the number of refunds given out, and thus, increasing customer loyalty and company income. Team 13 is proposing that K1 Speed implement the queueing software QLess into their customer experience. This system will relay updated waiting times to customers, enhancing their experience by alerting them with delays, providing safety guidelines, and allow them to enter the racing queue from home.

The projected deployment of this system at the Carlsbad location is estimated to yield a return on investment of approximately 240% annually, with a payback period of about 4 months and an annual cost of $10,920. Since every K1 Speed location in the United States employs the same system, extending this solution nationwide would result in significantly increased opportunities, with an annual cost of about $2.2M per year, and approximately $4.8M in profit through savings and additional sales.**

**Because we don't have access to statistics from other K1 Speed locations, our nationwide financial calculations are estimated. While our figures are estimated, Team 13 is overwhelmingly confident of the economic feasibility and return this solution will provide for all K1 Speed locations. A detailed financial analysis that shows how Team 13 arrived at these conclusions is shown in Exhibit L..

Business Analysis

Enterprise Analysis

K1 Speed is an indoor go-kart racing establishment known for its high-performance electric go-kart races. Since its first establishment in 2003 in Carlsbad, California, it has expanded to over 80 locations globally, with plans to open an additional 120 across the United States. Catering to both racers of all skill levels, K1 Speed aims to deliver an authentic racing experience. Beyond individual races, the company hosts group events for special occasions and corporate outings, offering packages such as exclusive track rentals and private racing lessons.

K1 Speed primarily operates within large indoor facilities, spanning tens of thousands of square feet each. These venues are designed to provide an immersive racing experience, including spacious lobbies, arcade games and, in select locations, offering a selection of alcoholic beverages. The company's primary revenue streams come from walk-in race fees and corporate bookings. Their business practices led to $3.6M of revenue last year, reinforcing the brand's biggest accomplishment - becoming the world’s largest operator of indoor go-kart racing.

Performance	How fast is data processed? What is the average wait time? What is the average go-kart life? How many requests can the application serve? What is the average number of complaints in a week?
Information	Quality of inputs and outputs and feedback What information do you need from customers? Are the wait times accurate and where is the information stored?
Economics	How much does the current system and software cost currently? What is the net loss from refunds over a week span, a month?
Control & Security	How much control does the company have with its customer information and promotions? Is technical maintenance done in house or outsourced?
Efficiency	How many customers walk away due to the wait time or onboarding process? How long does the whole process take, from door to race? How well does the current system handle changes or updates? How well do employees/customers like the current system?
Service	How satisfied are customers? How many customers return on average? How many customers return upon a bad experience?

Strategic Goals

In the 21 years since K1 Speed was founded, it has faced exponential growth, with 86 locations currently operating. They have a company wide goal to open 200 locations worldwide and to improve their information technology to match this expansion.

To ensure our solution would be beneficial to K1 Speed, we conducted a SWOT Analysis to outline the company's Strengths, Weaknesses, Opportunities, and Threats. We found that K1's major strengths are their quality, unique product, their use of in-house maintenance and R&D of their information systems, and their loyal customer base. Another benefit of K1's business strategy is their focus on indoor racing, providing opportunities to race in all seasons. But, due to their rapid expansion, bottlenecks in their customer management have lowered the company's potential revenue and customer loyalty. One of their main weaknesses is their lack of real-time updated wait times for customers and their niche target market. Right now, their biggest opportunities are vertical expansion, as they plan to operate 200 locations, and expanding their target market through the addition of extra activities. Their current threats are other karting venues, such as outdoor tracks that can accommodate faster karts, more competition, and a better pathway to becoming a professional racer. They are also facing competition from other family entertainment venues, such as arcades and sports venues like Top Golf.

Strength	● Offers a unique experience ● In house maintenance team and operations. ● In house IT and data management ● Large customer base
Weakness	● Other commercial entertainment ● Lack of Customer wait management
Opportunity	● Vertical expansion into 200 locations. ● Expanding target market by increasing breadth of activities
Threat	● Other karting venues with higher powered karts and larger spaces ● TopGolf, Arcades, Sports Venues

Our Goals

The scope of our project will be within K1 Speed's Customer Operations process. Their main goal, and the goal of this project, is to implement a race queueing system that will monitor and notify customers of wait times in real time. This new system will be integrated with Fikable, the database application they currently use to store customer information and race data. The Carlsbad K1 Speed income last year was $3.6M and this year, they hope to increase their income to $3.72M, with a goal of an additional $10,000 in sales monthly. Their current processes are on track to reaching this goal. Given our confidence to make their customer operations process better, faster, and cheaper, our team made a macro-goal to increase income by 20% through the implementation of Qless. To achieve this, our micro-goals are twofold: first, to decrease the number of refunds by 50% and second, to increase customer retention.

Business Area Analysis

Problems/Opportunities/Directives

As convenience and short wait times become increasingly more important to consumers, K1 Speed has to prioritize shortening wait times inside their facilities. Unlike competitors, K1 does not feature any online function for users to see current wait times or enter a waitlist from home. In order to find out about the existing wait time at the nearest location customers only have the option to either speak with an employee in person or to call their nearest location. All calls are routed to a help desk in the Philippines, who then routes you to your local K1 speed. Unfortunately employees are often preoccupied and are not able to take the call (this reveals another opportunity for K1 to enhance their customer management, but is outside the scope for this project). Alongside this, customers in line have no way to be updated when races are running off schedule.

There are two common issues for K1 Speed. First is losing the customer sale before checkout due to long wait times. If a customer comes in hoping to race within an hour of arriving, only to find out there is a 3 hour wait time, they will leave. Alternatively, customers may purchase races with a quote of 2 hours and will leave and come back. Due to the variability in race times, their races may occur earlier or later than estimated. This results in the customer missing the race, and needing to wait additional time. This often leads to an average of 4-6 refunds on weekdays and 20-30 refunds on weekends, which costs the company roughly $1,700 per week per location.

To combat this issue, we are proposing the company introduce the queueing application QLess to be used alongside the K1's enterprise software, Fikable. In the Proposed Technical Solution and Economic Feasibility sections, we will go into more financial and technical details that our solution will provide.

Strategic performance measure	Baseline measure	Target measure
Total Sales	$3.6M annually (Carlsbad location)	K1's goal: $3.72M annually Our goal: $4.32M annually
Average Wait Time	2 hours	30 minutes
Refunds/Compensation	$6,720 monthly (average)	$3,360 monthly (average)

Current Process Analysis

Process Overview

K1 speed's primary income comes from race sales. These races can either be used during the same day or be saved on one's account for future use. Currently, K1 Speed needs an improved customer management system to scale with their growing customer base. Recent reviews have criticized K1 Speed's egregious wait times. When this information isn't relayed to the customer in real time, customers end up waiting in the facility for hours longer than required. This dissatisfaction among customers due to poor management has led to an increase in refunds and a decrease in customer loyalty and retention. Thereby raising business expenses and reducing revenue.

K1 Speed has 2 different types of customers: Priority Customers pay a premium for a reservation of the track, a certain number of races, and/or the whole facility. Meanwhile the majority are Walk-In Customers, who plan on purchasing and racing the same day. Regardless of the type of customer, everyone is required to login or create an account. This is where the process begins, with users inputting their personal information, email address, and an emergency contact (Exhibit B.5). This process is completed through the K1 Speed kiosk, where the account information is compiled into a personalized user profile and stored in Fikable.

After signing in, customers are then prompted to visit the register and purchase races from a selection of various packages (Exhibit C.1). Before checkout, each customer will be prompted to sign an electronic liability waiver. After purchasing their desired bundle, the transaction receipt is emailed back to the customer. Transaction details and races purchased are then assigned to the customer's account. Employees then give an approximate wait time for the customer based on track capacity and existing queue times (Exhibit C.2).

Although the estimated wait time provided is static, the actual race times can vary significantly. When customers are told to expect a wait of a few hours, these times can fluctuate due to various factors such as other racers leaving early, experienced racers finishing quickly, crashes, and kart malfunctions. This variation results in customers being called to race much earlier or later than scheduled. Many customers are unaware of these variations, particularly if they are absent from the facility. Consequently, numerous customers have expressed dissatisfaction upon returning and discovering they have missed their race and must wait longer, if they are still interested.

Just before the end of a race, all customers enter in the next race and are called over the intercom to the racing pit. This is where they are given a rule debrief, safety measures, racing etiquette, and how to operate the go-kart (Exhibit C.3). Lap times and race positions are then saved and emailed to customers once completing the race. Along with the racing statistics, the email also includes coupons and advertisements that serve as an additional touchpoint with K1 Speed. This gives K1 the ability to increase customer retention and sales through promotions. The racing statistics are also sent and stored in Fikable. This information stores notes and warnings in the event of reckless drivers and accidents.

Summary of Problems & Opportunities

Wait times at K1 Speed can vary from 10 minutes to 1 hour on weekdays and 1 to 3 hours on weekends. As a result, K1 loses sales, customer retention, and income due to wait time ambiguity and variability, as seen in our PIECES diagram (see Exhibit K). In addition K1 has to provide additional compensation to customers who miss races or have unforeseen longer wait times. This core problem is due to limited communications between the Information Systems and Customers.

K1 Speed's current system is lackluster at best as the original enterprise location would like to accumulate $310,000 in monthly sales, but is reaching $300,000 in monthly revenue. Fixing this issue would bring in an additional $36,208 in sales per month and allow K1 to crush their goal.

Often, crew members are responsible with handling customer frustrations regarding the current system. In one case, after a mother missed her son's first race, an employee became concerned that she may react violently. After retreating to the breakroom, the mother threatened to enter the track during a race, prompting the intervention of law enforcement who escorted her off the property. Admittedly this was an isolated instance, however, employees dealing with customer frustration is very common. An additional benefit of fixing the current system is an improved employee morale. A happy employee results in an increase in production and a reduction in turnover, all beneficial to the enterprise.

A system that would allow users to view wait times at their own convenience, (both before and after purchasing races) would save K1 money on refunds and provide additional sales to the company. This year, K1 aims to increase revenues by about 5% company-wide, and are currently on pace to meet that goal. As the company looks to gain revenue and scale the company, it is imperative that they implement a modernized system for their customers' experience. We estimate that such a system would reduce in-person wait times for customers from 2 hours to 30 minutes on average during peak times and beat their financial goal by 25%.

Proposed Process Analysis

Our team compared and analyzed 3 potential solutions for designing and implementing the Racing Queue system. During our first meeting with Frankie, he stated that a functional requirement for such a system would be real time processing and updating of information. Firstly, the new system would need to have customer onboarding capabilities to ensure liabilities waivers are signed, and ensure secure storage of information. This information would then need to be reflected in tangible real wait times to ensure accuracy. This system would also have to be compatible with K1 Speed's current queue system, Fikable. After much research and these requirements in mind, the team found a Software as a Service (SaaS) and commercial off the shelf (COTS) solution to fulfill these requirements - QLess. The team agreed with this solution unanimously for the following: Fikable integration, real time updates and processing, and cost effectiveness.

QLess allows customers to join a queue from anywhere and save their spot in line. The addition of the service would not impact the current procedures for processing customer payment and race allocation. The QLess system would simply add a step at the beginning of the process, resulting in a more efficient process overall. The QLess system provides customers with real-time wait times, and can send updates to customers as their race time approaches. These processes are detailed further in Exhibit G. As time passes, these wait times would become increasingly accurate, as QLess utilizes algorithms and machine learning techniques that estimate wait times based on prior data. Along with these benefits, the QLess system would also provide K1 Speed with valuable data analytics about customer behavior that could allow them to further improve their practices. Team 13 has been quoted a price estimate of $10,920 per location annually for the company’s use of this application.

Alternatively, Team 13 explored the possibility of K1 Speed implementing their own live-update queue directly into Fikable. However, the team for Fikable currently sits at about 5 people, who act both as software developers and support for the program. This would likely mean the company would either need to hire additional staff, or face long wait times for such a function to be developed and released for use into the program. On the same token, Fikable’s small work force may take longer to address catastrophic problems. Along with this, the company would also likely need to pay for additional web server use to compensate for the additional traffic to the company’s website. Because of these issues, Team 13 determined the ease and quickness of implementing the QLess system would make the most sense for the company at this time.

After thoroughly investigating various cloud-based queueing systems to find the most suitable solution for K1 Speed's unique requirements, our team explored alternatives such as QFair and Waitwhile in addition to QLess. We recognized that these systems offered other valuable features, making them attractive options for certain businesses. However, after researching we discovered that QFair and Waitwhile were primarily designed for businesses that rely on scheduled appointments, such as salons, clinics, and professional services.

Considering that K1 Speed's primary customer base consists of walk-in clients who expect to be served on a first-come, first-served basis, we determined that a system tailored to appointment scheduling would not be the right fit. We understood that walk-in customers value the flexibility and convenience of arriving at their desired time without the need to plan ahead or commit to a specific time slot. Therefore,

we decided on a queueing system that prioritizes walk-ins and efficiently manages the flow of customers in real-time.

After reviewing capabilities of each queueing system against K1 Speed's specific needs, our team concluded that QLess is the best fit. We found that QLess offers a comprehensive set of tools and functions that cater to businesses with a high volume of walk-ins. Its ability to efficiently manage queues, provide accurate wait time estimates, and facilitate smooth communication between both sides of the transaction aligns perfectly with K1 Speed's operational model.

Moreover, we appreciated QLess's user-friendly interface and customizable features, which allow K1 Speed to adapt the system and its dashboard to their specific requirements. This ensures a smoother integration with their existing processes. The system's scalability and reliability also will be able to accommodate K1 Speed's growth over time.

In conclusion, while our team acknowledged that QFair and Waitwhile are valuable cloud-based queueing systems in their own ways, our evaluation revealed that QLess is most suitable for K1 Speed. By prioritizing the needs of walk-in customers and offering a robust set of features for their business model, we believe that QLess empowers K1 Speed and its customers to make more accurate information based decisions.

Proposed Technical Solution

Our proposed technical solution leverages a queue management system from the company QLess. This system is designed to improve K1 Speed with enhanced control over customer flows through the advanced machine learning capabilities offered in the application. By using these features, K1 Speed can effectively monitor both real-time data and historical customer behavior patterns. Some of the metrics may include the variance of race times/consistency index, incident reports, and driver experience levels. These metrics can be analyzed to predict traffic patterns for each location and offer more accurate wait times for customers.

QLess is poised to alleviate resource constraints within K1 Speed, primarily through its utilization of cloud technology. This eliminates the need for purchasing, installing, and deploying dedicated hardware, software downloads, and server infrastructure responsible for SMS text messages and a continuously updating queue. Moreover, QLess boasts integration capabilities with the Fikable database.

In addition to operational efficiencies, QLess provides tangible benefits to K1 Speed employees by automating some of their responsibilities (Exhibit H.1). These insights highlight instances of bottlenecks in real-time, enabling proactive responses from K1 Speed locations. Furthermore, QLess equips K1 Speed with robust tracking and reporting tools, yielding valuable insights such as employee performance metrics, customer demographics, return rates, wait and fulfillment times, and segmentation analysis. These features collectively empower K1 Speed to optimize its operations and enhance the overall customer experience.

Proposed Physical Process Discussion

The QLess system will be added to K1's business as the first step in the customer process. First, the customer will log on to the QLess page for their location. They will access the link either from a web browser or through a QR Code posted in the location. They will then input their name, email, and phone number, and enter the line (Exhibit H.1.). The customer will choose what notifications they want to receive; text message, email, or both. Intervals for these notifications will be set by the company. Then the customer will be redirected to a page with an estimated wait time, the number of races ahead of them, and a safety video. The customer will then arrive at the location close to race time, and proceed with the rest of the process as it is currently designed.

Solution Assessment

How does the solution support the enterprise?

Implementing QLess at K1 Speed in Carlsbad would significantly aid the enterprise's customer retention issue. Currently, customers are assigned specific race times upon entry to the facility. However, the current system lacks live queuing updates and SMS customer messaging, leading to uncertainty if someone ahead cancels, potentially causing missed race times and longer wait periods upon return. As discussed earlier, the lack of a proper reservation management system results in the mismanagement of customer reservations. This leads to refunds and, complimentary races at a rate of 4-6 refunds on weekdays and escalating upwards 26-30 refunds on weekends.

Implementing an effective queueing system is expected to reduce the need for refunds, particularly since approximately 40% of all reported complaints stem from wait times and missed races. As a result, there would be fewer refunds and free races issued, enhancing sales performance and aiding in surpassing the monthly revenue goal of $310,000.

The implementation of QLess would also likely lead the company to expand its customer base, and increase its rate of returning customers. Moreover, the implementation of QLess would not only improve customer satisfaction but also enhance employee productivity and well-being. Employees would no longer need to deal with angry customers or spend time on repetitive tasks like manually checking the racing queue, allowing them to focus on more meaningful and value-adding activities.

What specific benefits and consequences will the system provide?

The implementation of the new queuing system at K1 Speed promises a range of specific benefits and potential consequences. By offering customers real-time visibility into wait times, the system addresses the current challenge of missed reservations, cancellations, and dissatisfaction leading to refunds. This transparency not only enhances customer satisfaction but also aids employees with precise wait time information to better manage customer volume and expectations. The system's accuracy and efficiency streamline operations, reducing the likelihood of overbooking or underutilizing resources, ultimately improving overall business performance and efficiency. However, employees must undergo thorough training on the QLess application to effectively assist customers unfamiliar with queuing procedures, ensuring a smooth transition to the new system. This mitigates any potential resistance or confusion among customers accustomed to the previous system. Additionally, system maintenance and updates will be necessary to address any technical issues and optimize the system's functionality over time.

On the other hand, some consequences to the new proposed system can include its substantial cost, as well as the challenges associated with transitioning to a new system within the company. The

implementation of the new customer management system will incur an annual cost of $10,900 for each location, a significant expense compared to the lack of a current system, which has no additional costs.

Introducing a new system can disrupt established processes and routines, leading to a temporary dip in productivity and efficiency as employees must familiarize themselves with the new system's features and functionalities. This learning curve can be challenging for those who have become accustomed to the existing system, potentially leading to resistance or frustration during the transition phase. In addition, customers will most likely have a small learning curve as the new software is a new interface to the business as a whole. Resistance can also come from potential customers resistant to the new proposed technology.

Moreover, the transition process may require additional resources, such as dedicated training sessions, user manuals, and ongoing support from personnel or external consultants. This further increases the overall cost and complexity of the implementation. Ensuring data integrity and seamless migration of existing customer information to the new system is also a critical consideration, as any loss or corruption of data could have severe consequences for the business.

Other potential consequences relate to data. For instance, there may be a delay in QLess's ability to establish accurate customer behavioral statistics, potentially impacting the initial days of the launch. Without sufficient historical data, the insights provided by QLess may be unreliable. Additionally, the metrics formulated by K1 could have significant implications for future business strategies.

While the proposed system may offer enhanced features and capabilities, the potential disruption to daily operations and the substantial financial investment required should be carefully weighed out in comparison to the anticipated benefits. A comprehensive management plan, clear communication with employees, and adequate training and support resources may be necessary to mitigate the risks associated with the transition and ensure a smooth adoption of the new system across all locations.

Who will benefit (or lose) from the proposed system, and how?

Using QLess and implementing it into K1’s current system would solve many issues at hand for K1 Speed addressed in Section A. Both parties would mutually benefit with the new system as employees are better equipped to manage races and customers and customers have a way to stay updated and informed during wait times. The main issue for K1 Speed's current system is lacking information regarding customer information and wait-times, which can lead to refunds/cancellations on their reservations when being told wrong wait-times. Implementing a more robust system would bring less confusion and better overall customer experiences, while also profiting the company with lower refund rates, with a potential ROI of 174% annually . K1 Speed will have to pay a yearly fee of $10,900 per location, which will work hand-in-hand with the current Fikable system; more detailed calculations can be seen in Exhibit L.

While implementing QLess' robust system into K1 Speed brings many benefits, some resistance may be met by people currently in the organization. Some employees may resist the idea of managing two systems concurrently. This hesitation could stem from an increase in workload and possibly having a preference for the current system.

Along with this, although QLess is an addition to the current system, some employees from the in-house company, Fikable, could view the new system as competition and potential for job displacement in the future. Additionally, integrating and managing QLess to 200 locations could see reluctance from the executive level. Executives having to oversee the implementation process and ensure smooth operation across all sites could be discouraging, particularly if it involves additional time, resources, or training. Addressing these sources of resistance will be crucial in successfully implementing the proposed system and realizing its benefits for K1 Speed.

Feasibility Analysis

During our first meeting with Frankie, he mentioned that this particular location was losing $6,700 monthly due to refunds that resulted from unsatisfied customers. As a result we performed a financial feasibility analysis that took into account the refund rate, while considering the overall cost and benefit (refund reduction) ratio of implementing such a system. For this section we took Frankie's most conservative refund estimate, which was about 100$ a day for a total of 5 refunds. With this in mind we calculated the total loss for this location to be $57,278 over the next 5 years. With these figures we were able to calculate the net present value of benefits to be $156,762 over the next 5 years. This gives an overall NPV of $99,484. In addition, if this system were deployed in all 32 locations; the NPV of the enterprise would be $3.49 million over the next 5 years. This would result in higher profit margins for the enterprise.

Our next calculation was the present value of cost. We estimate a $10,000 cost for Fikable programmers to modify their current system for the QLess integration, alongside a yearly recurring cost of $10,920 at a 5% discount rate. This puts the present value of cost at $57,278 over the next five years. With these figures in mind we estimate that the implementation of our proposed system will yield an overall net present value of $99,484 over the next 5 years. In addition, we also concluded that such implementation would yield a return on investment of 1.74 over 5 years. Exhibit L depicts our detailed financial analysis.

Our next consideration was the breakeven point. Since QLess is a subscription service that has a yearly recurring fee we decided to focus on yearly cost. After the first year, which will see a longer payback period due to one-time onboarding costs, we found that the company would break even after 152 days, in mid-to-late March, for further detail please refer to Exhibit L .

Operational Feasibility

Within the organization, location staff members manage employee onboarding and communicate wait times to customers. At K1 locations, customers rely on staff members to provide wait time information, which is accessed through the in-house application, Fikable. While not without its merits, Fikable falls short in terms of information delivery, efficiency, and service quality. Following discussions with a QLess representative and Frankie, integrating Fikable with QLess is projected to proceed smoothly with minimal resistance. However, there may be pushback from Fikable developers due to increased workload. Team 13 foresees resistance from employees as the new system necessitates additional training, potentially unsettling those accustomed to the previous system. Nevertheless, the implementation of this integrated system promises substantial enhancements in the enterprise's information management, operational efficiency, and service delivery processes. QLess is poised to revolutionize wait times and accuracy, thereby boosting overall performance and information accessibility. With QLess expediting customer flow, Team 13 expects an increase in customer throughput, leading to enhanced efficiency. Moreover, improved service delivery is anticipated, with customers receiving prompt service and accurate wait time estimates, resulting in heightened satisfaction levels. Team 13 arrived at these conclusions through analysis using the PIECES chart outlined in Exhibit K.

Technical Feasibility

Functionally, as seen in Exhibit I, Figure 1, the queue system involves customers visiting the QLess/K1 Speed website to go through the on boarding process. QLess being integrated with K1 Speed's enterprise application Fikable allows customer's information to be stored and processed.
Once the customer has gone through the onboarding process their spot will be saved and receive an approximate wait time. This information is stored and processed again to provide real time updates. If a customer in line decides to drop their place in line this information is updated and reflected in real time, notifying customers about a new wait time and providing an accurate time to incoming customers. When referencing Exhibit F, figure 4, all data flows are maintained through QLess with wait times and customer information being processed with Fikable. QLess would simply need to be integrated with Fikable by their developers. According to Frankie, Fikable developers are capable of making this change, but the development time is unknown. In addition, Qless is both reliable and capable of delivering this system.

Security Feasibility

As far as security, QLess is a secure system that would pose minimal risk to K1 Speed and its customers. Because it is simply a queue system, customers only provide the QLess system with their name, email address, and phone number. More sensitive information, such as payment details, is managed by the highly reliable Fikable application. QLess is run through Amazon Web Services, which has exceptionally strong infrastructure in place to prevent security breaches.

The primary concern would be with the integration of data between QLess and Fikable. As we expect data from QLess to be exported and shared with Fikable, ensuring that data is transitioned smoothly between the two systems would be an integral aspect of initial onboarding.

Implementation Plan

Team 13 recommends that K1 Speed use QLess as their new queuing management system integrated with their in-house application Fikable. QLess will be continuously supported and updated by QLess themselves, and on K1's side, managed by Fikable. Exhibit I outlines a demonstration of how to use QLess. We recommend K1 Speed have a soft launch at a few locations at first to work out bugs and kinks before launching enterprise-wide. We also recommend that Fikable developers be notified about the change 3 months in advance so that they can make necessary preparation on their side. Employees should also be trained one month in advance. Training should include knowing how to sign up to be able to assist customers who may have trouble with technology, and how to manage the queue in the system. During the soft launch, K1 Speed should continuously monitor performance of the new system. They should specifically focus on customer satisfaction, customer feedback, and employee usability, wait times, and revenue. We recommend that this monitoring last 3 months to get an accurate performance evaluation.

Ideally, K1 Speed should see a decrease in complaints and refunds. They should also see an increase in revenue and number of returning customers. The specifics of these numbers are seen in the table under Team 13's Business Area Analysis. Team 13 is confident that after one month K1 speed should hit their monthly sales goal of an additional $10,000 a month and support the enterprise goal of expanding to 200 more locations. By month three they should have met their monthly goal. By this time the enterprise should consider the integration of this system to other locations, following the steps until eventually all locations have the system implemented.

Conclusion

K1 Speed currently faces major challenges with managing customer flow and wait times, leading to dissatisfied customers and lost revenue from refunds, cancellations, and loss of sales. Through a comprehensive analysis, it is clear that implementing a digital queuing system like QLess can significantly solve these issues and provide substantial benefits to both K1 Speed and its customers. The proposed solution QLess will dramatically improve the quality of life between both ends of the process.

The QLess system will further empower customers by providing real-time visibility into queue status and wait times before even arriving at K1 Speed locations. This upfront transparency sets proper expectations and reduces ambiguity preventing customer dissatisfaction over the long term. Customers can remotely join queues from their phones, allowing more flexibility with their personal time rather than waiting at the facility. This new flexibility allows customers to rejoin the line later if wait times are too long and will reduce turnover rates. The improved customer experience and operational streamlining are projected to increase sales by 5% at the Carlsbad location alone while cutting the number of refunds in half on average.

By transforming one of its biggest pain points into a competitive advantage, K1 Speed will be able drive growth through more accurate wait times, flexibility, and an exceptional customer experience. Our team recommends that K1 Speed implements the QLess digital queuing solution at its Carlsbad location first, with a plan to expand the system to all locations based on its success. The ROI forecasts and process improvements outlined in this report demonstrate QLess as the ideal path forward for K1 Speed to achieve its strategic goals for customer loyalty, revenue growth, and continued market leadership.

For the Enterprise:

After conducting thorough research and analysis encompassing customer feedback, employee perspectives, industry benchmarks, and market trends, Team 13 is excited to present our findings to K1 Speed. Our investigation revealed the pressing challenge of managing customer flow and wait times, prompting us to explore potential solutions. After careful consideration, we recommend implementing QLess, a digital queuing system, to address these issues. By providing real-time updates on wait times, allowing remote queue joining, and streamlining operations, QLess is poised to significantly enhance customer satisfaction, boost revenue, improve employee morale and retention, increase productivity, and reduce refund rates. We are confident that our proposed solution will drive substantial improvements across multiple dimensions of K1 Speed's business, positioning it for long-term success and growth in the competitive entertainment industry.

Individual Post Mortems:

Jacob's post-mortem:
Our recent project to implement a new queueing system at K1 Speed provided many future initiatives. Reflecting on the project, one critical lesson I learned was the importance of adhering to the schedule more rigorously, as procrastination caused delays and additional stress. Moving forward, I will prioritize improving time management and revisiting the gantt chart more often to monitor my milestones against the schedule. Additionally, I believe we had the potential of adding more KPIs that would've offered deeper insights to the new system's effectiveness.

Javier's post-mortem:
I think this project was truly different. Initially I didn't think I was up to the task, mainly because I had never gone out into the real world and worked on something like this. There were a lot of no's initially, which was demoralizing, but after a while we found a few companies to work with. As a team I think we were all excited to finally be working on this project once we had a company. I also did learn a lot about systems analysis and I feel like I got a lot of hands-on experience. In future I would like to work more on process models since I think that's my biggest weak point, and like Jacob said, prioritizing time management to get a better analysis. Overall, I enjoyed this project and working with the group.

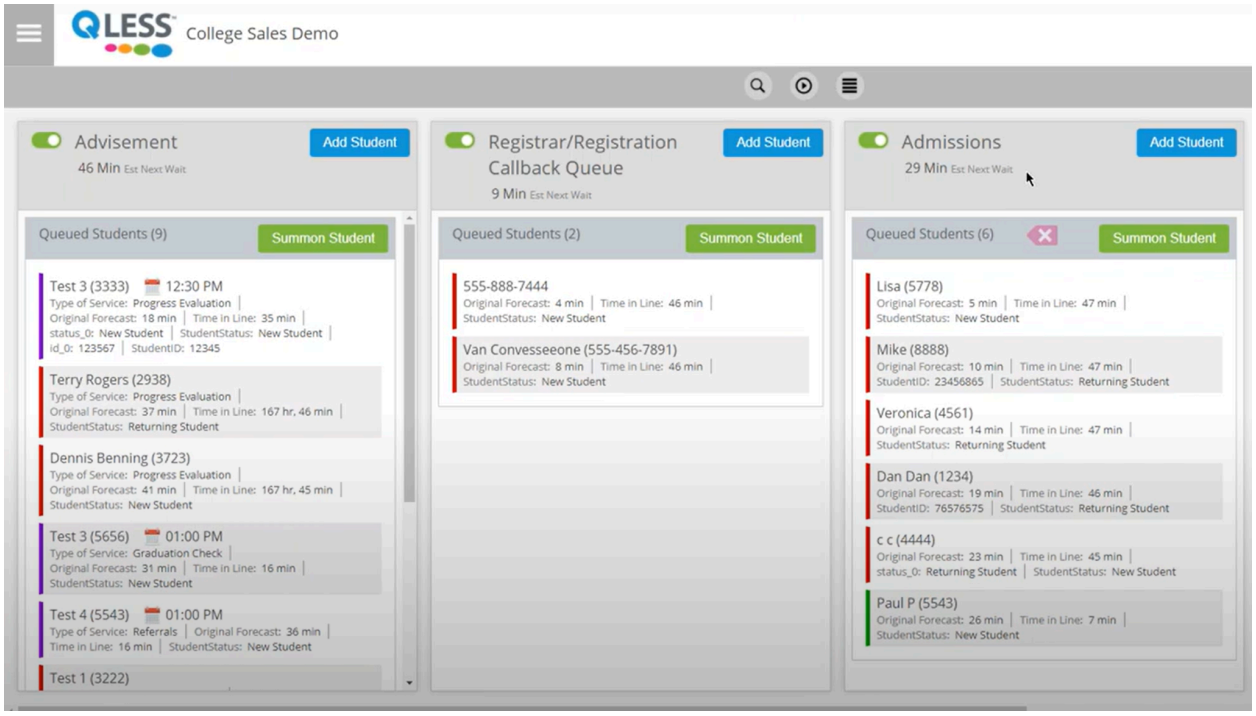
Quan's post-mortem:
Overall this project helped me learn more about systems thinking and design as we broke down K1 speed as an enterprise. Before K1 speed we had other businesses in mind from connections made at career fairs but as start up companies their scopes were too broad given our time frame of one semester. It was also unique in the sense that the business had a really unique niche in the entertainment industry. Data flow diagrams and the Gantt chart gave me insight into project management and overseeing varying tasks. I could not imagine working on multiple at once with stricter deadlines. I could use more practice with DFDs and process models as most businesses do not have this niche of walk-in racing customers.

Michael's post-mortem:

Working as a mock system analyst for a semester was an incredible experience. Being able to work with a real company provided insight into what life would be like post-graduation. While the project initially presented challenges, I was fortunate to have supportive teammates who worked effectively and were there when I needed help. This project showed me the importance of maintaining open communication with teammates. I look forward to taking what I learned from this experience and applying it to future projects.

Kyle's post-mortem:
This project was a good experience. I really enjoyed that this project forces us to work with real world companies, as it adds a level of understanding to concepts learned in school that I haven't experienced elsewhere yet at SDSU. Overall, this was a solid experience, and I will definitely use lessons learned from working on this project in the future.

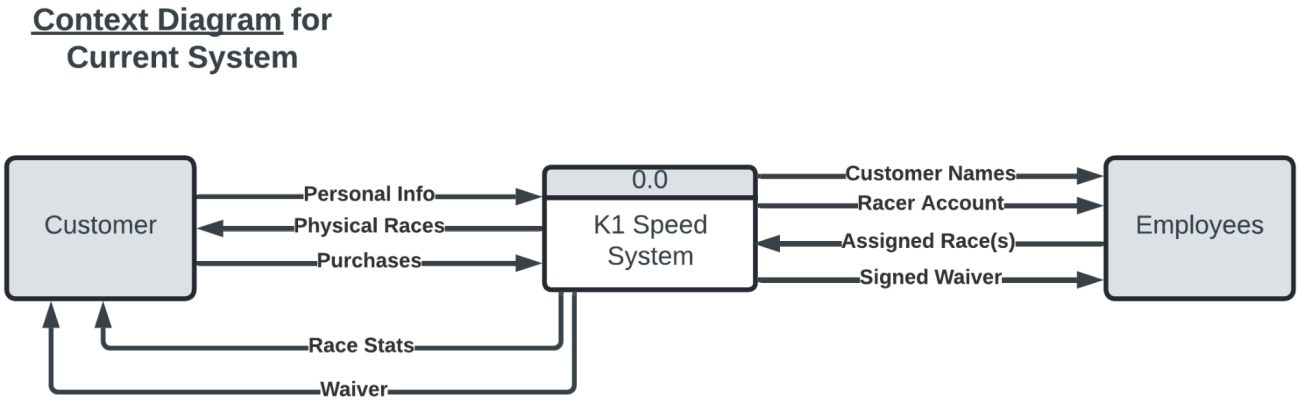
EXHIBIT A: QLess Walk Through



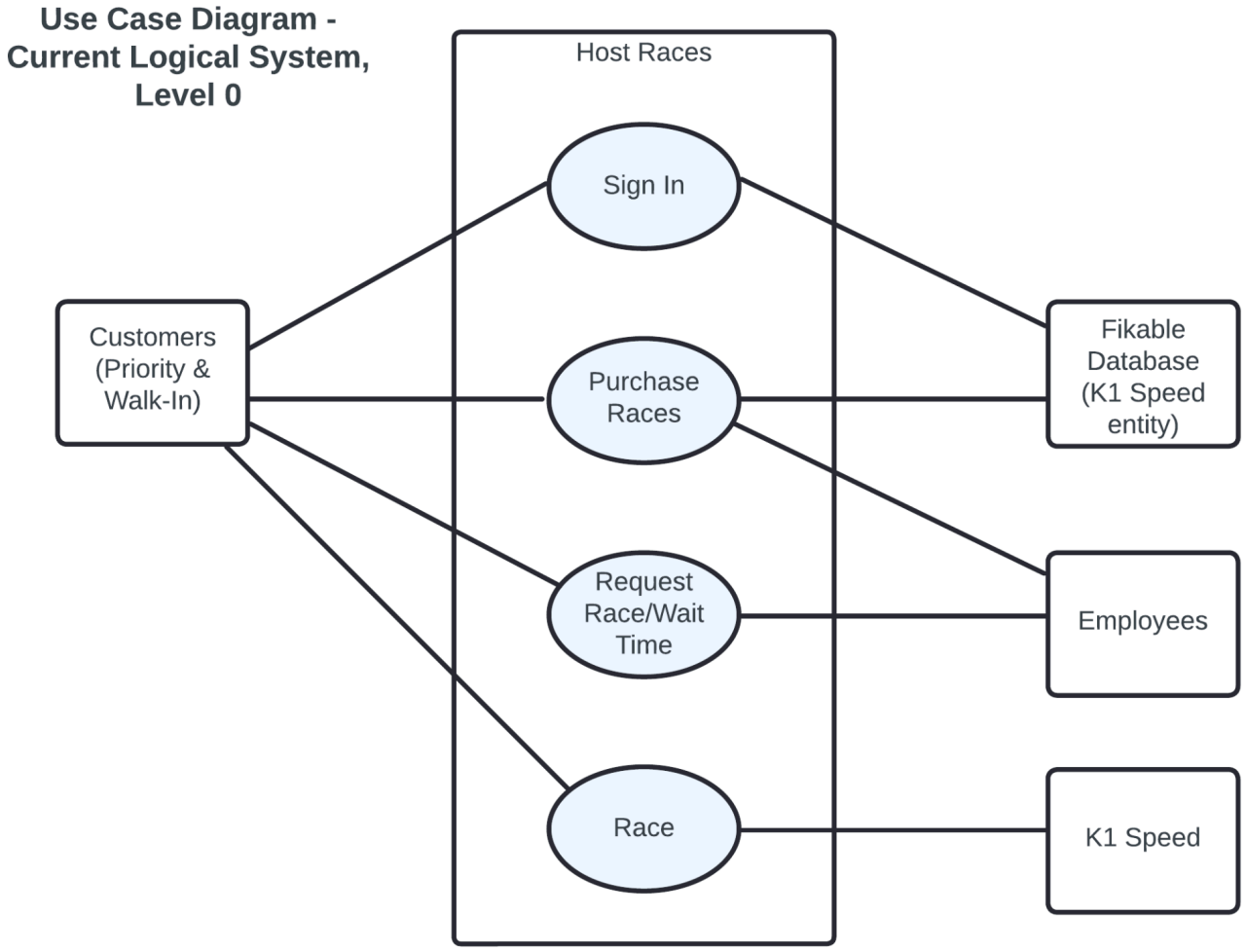
*From QLess's YouTube Channel

EXHIBIT B: Current Logical Process Models

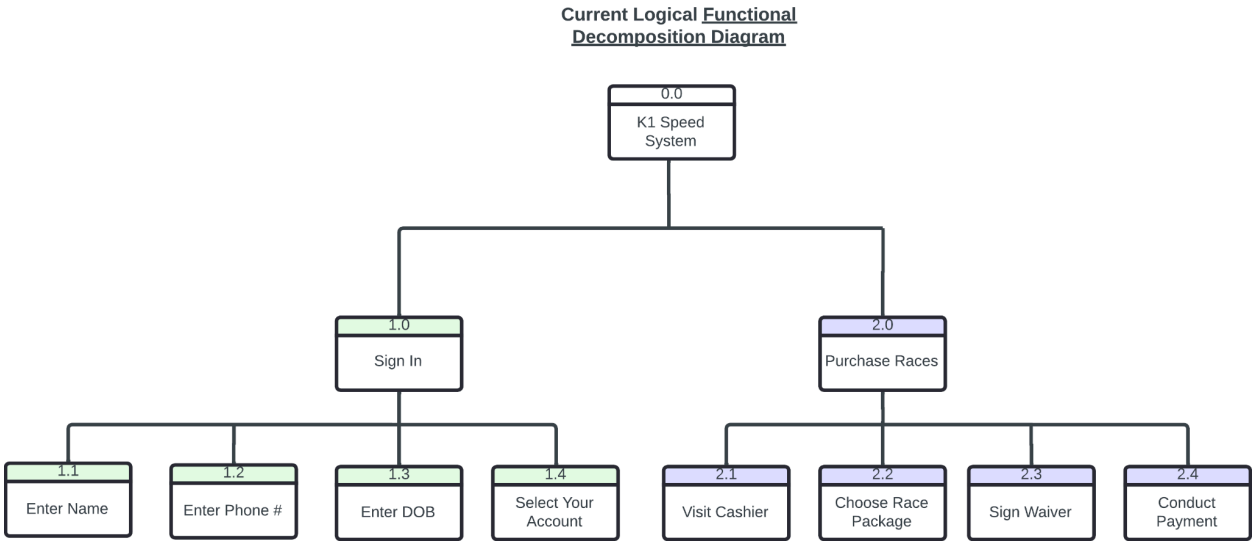
1. Current Logical Context



2. Current Use Case Diagram



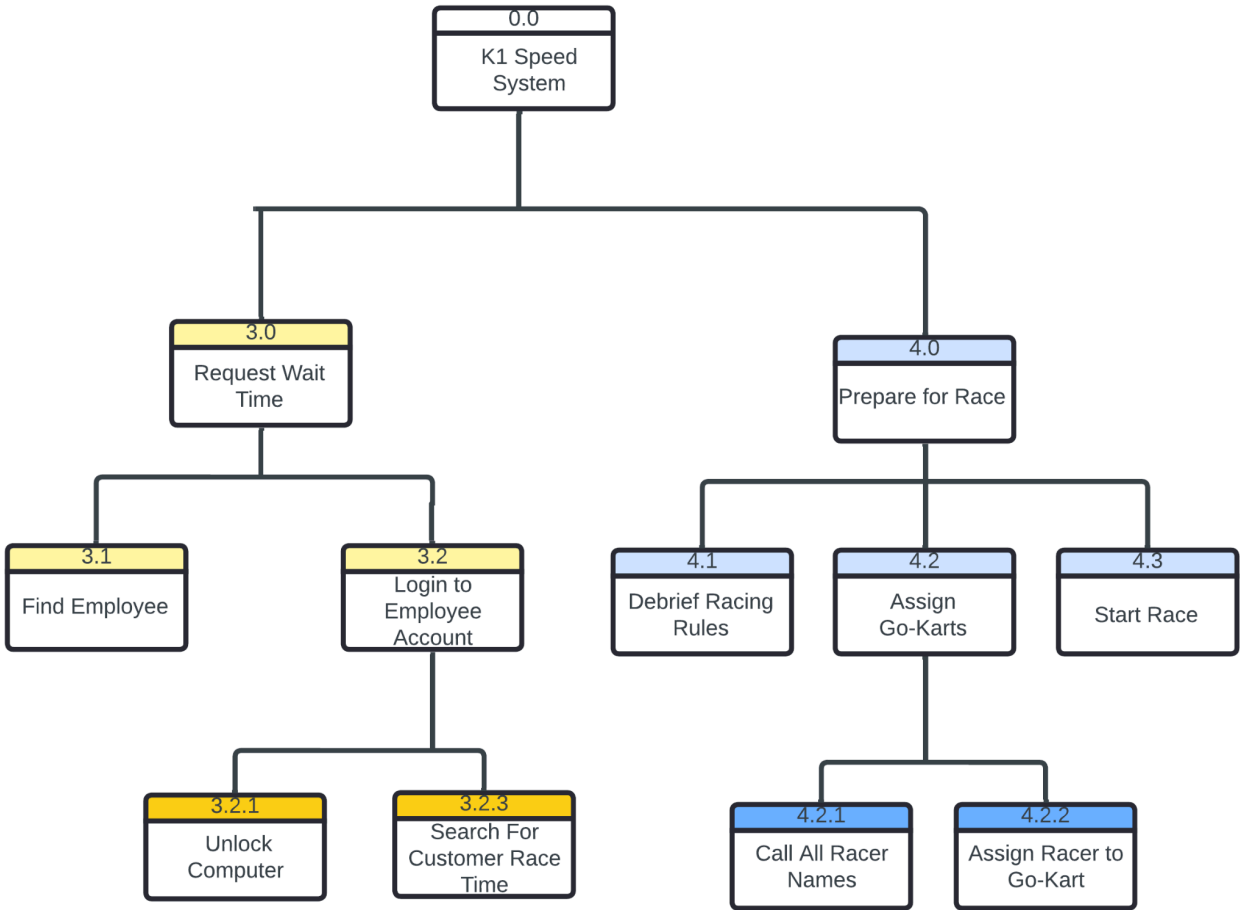
3. Current Logical Functional Decomposition



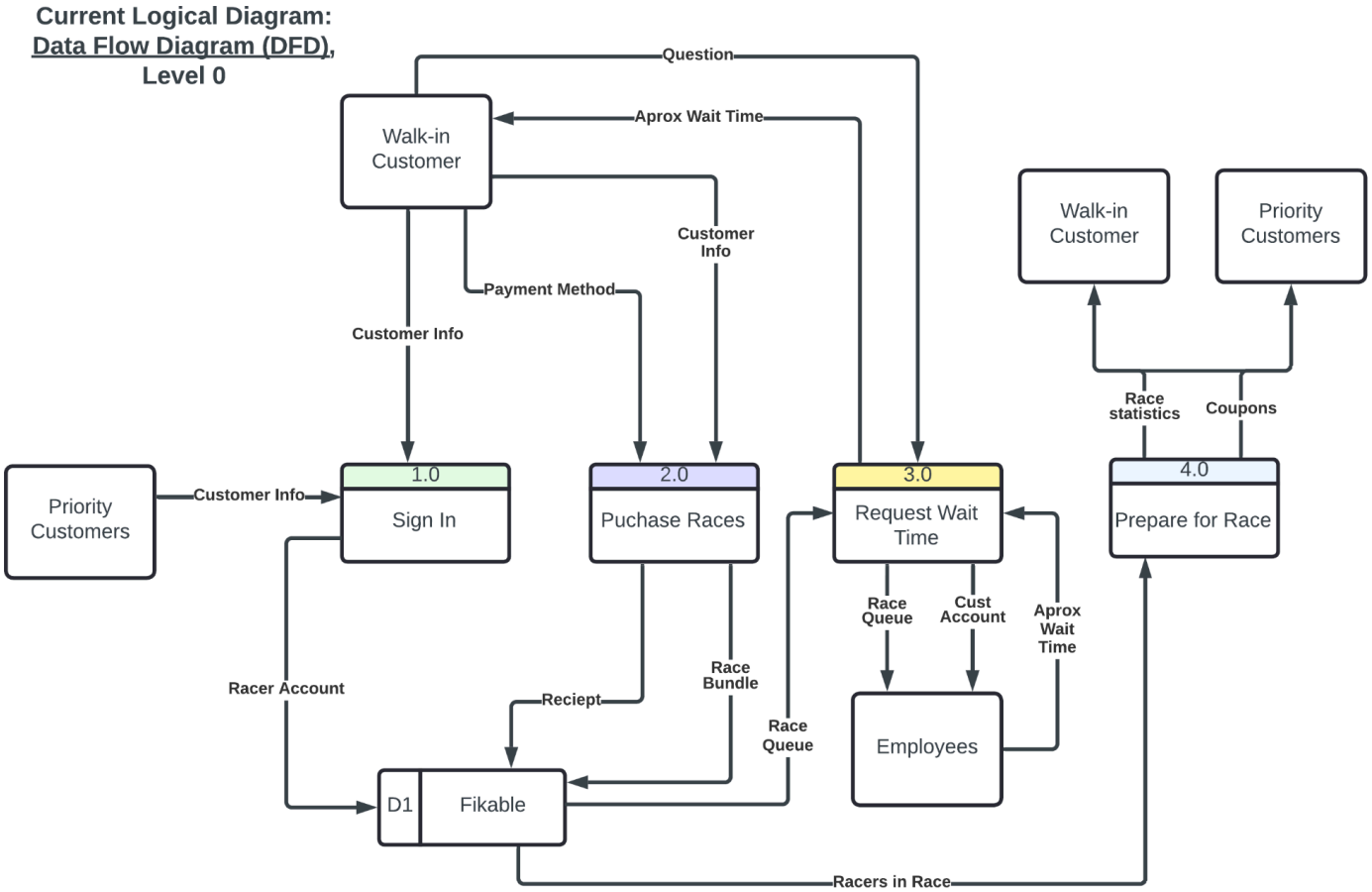
** Due to the width of this diagram, it has been split into 2 parts. See the second half of this diagram on the next page.

3. Current Logical Functional Decomposition Continued

Current Logical Functional Decomposition Diagram



4. Current Data Flow Diagram



5. Current Logical Diagram Level 1 Process 1

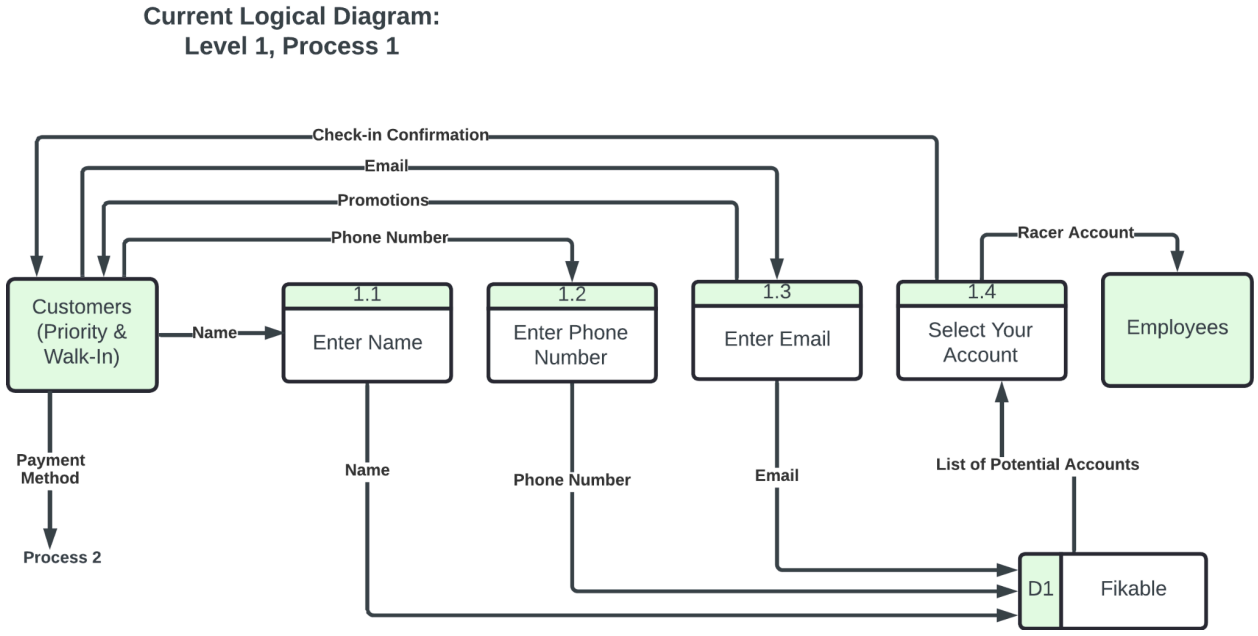
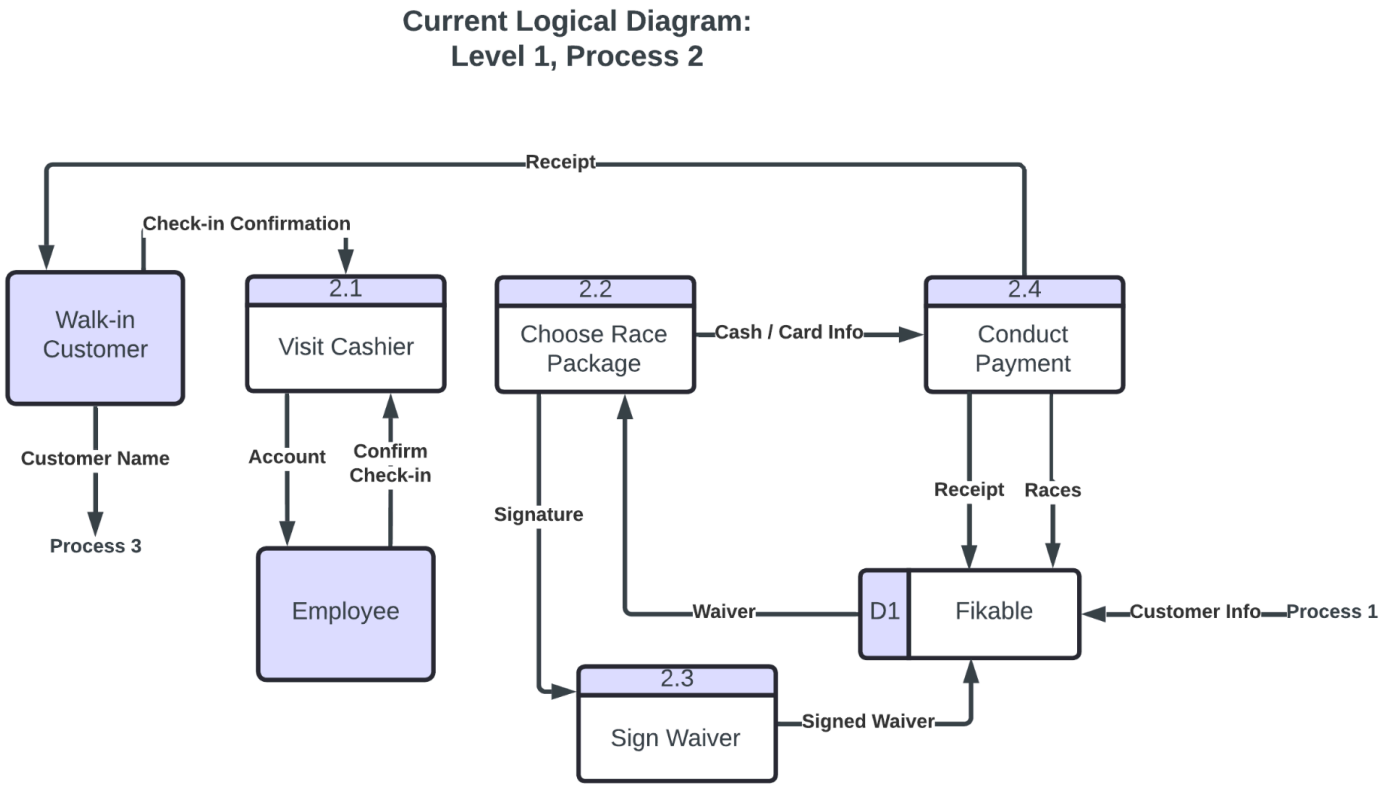
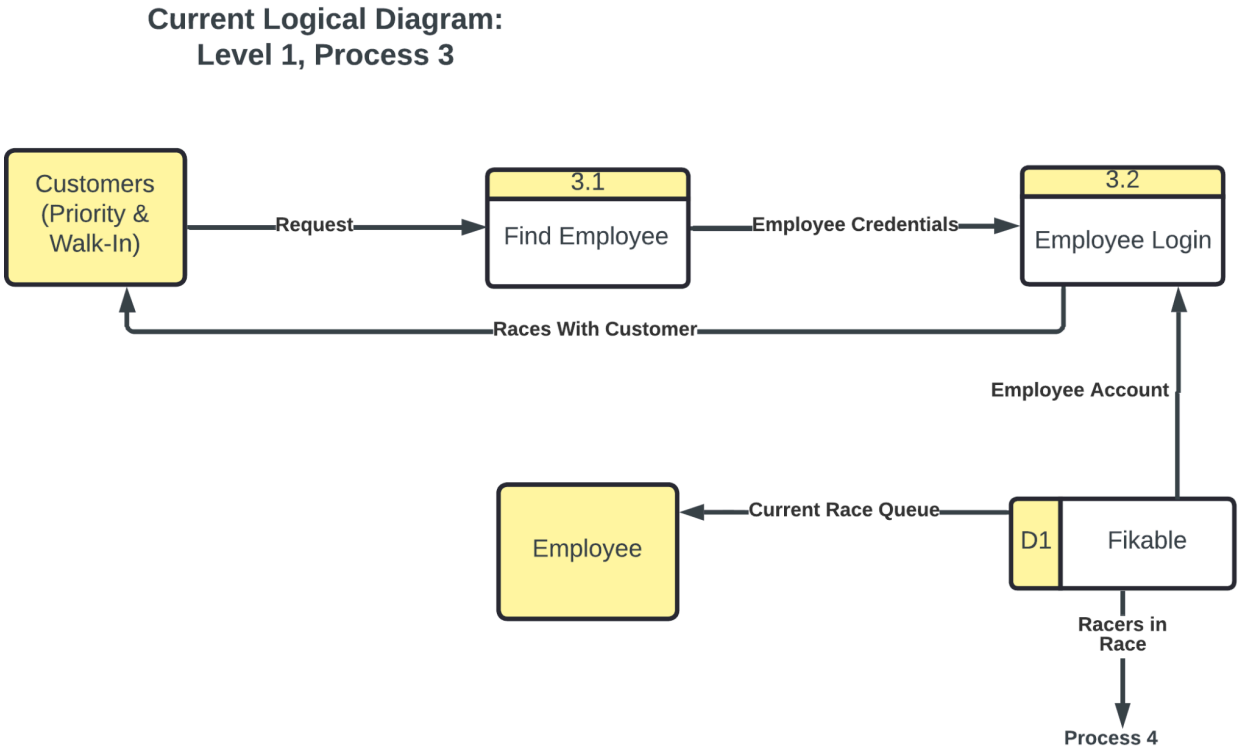


EXHIBIT C: Current Level 1 Processes

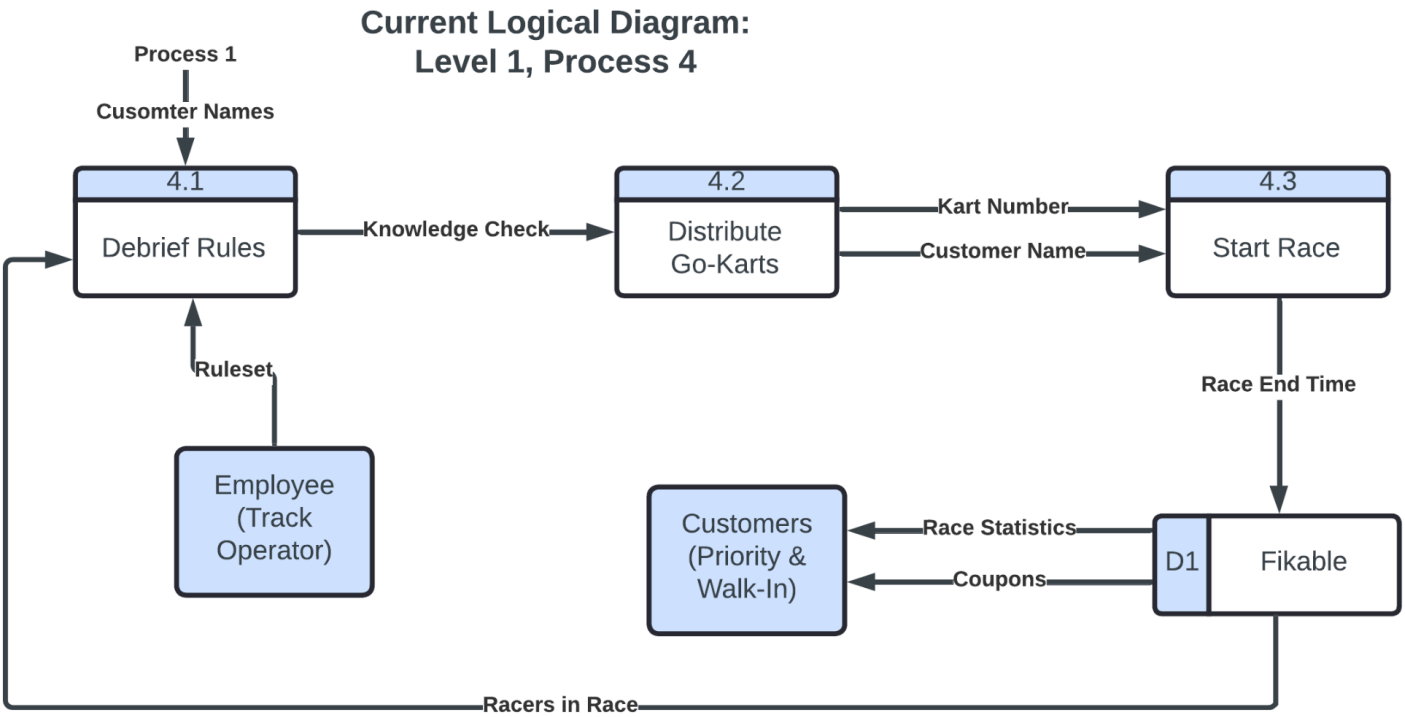
1. Current Logical Diagram Level 1 Process 2



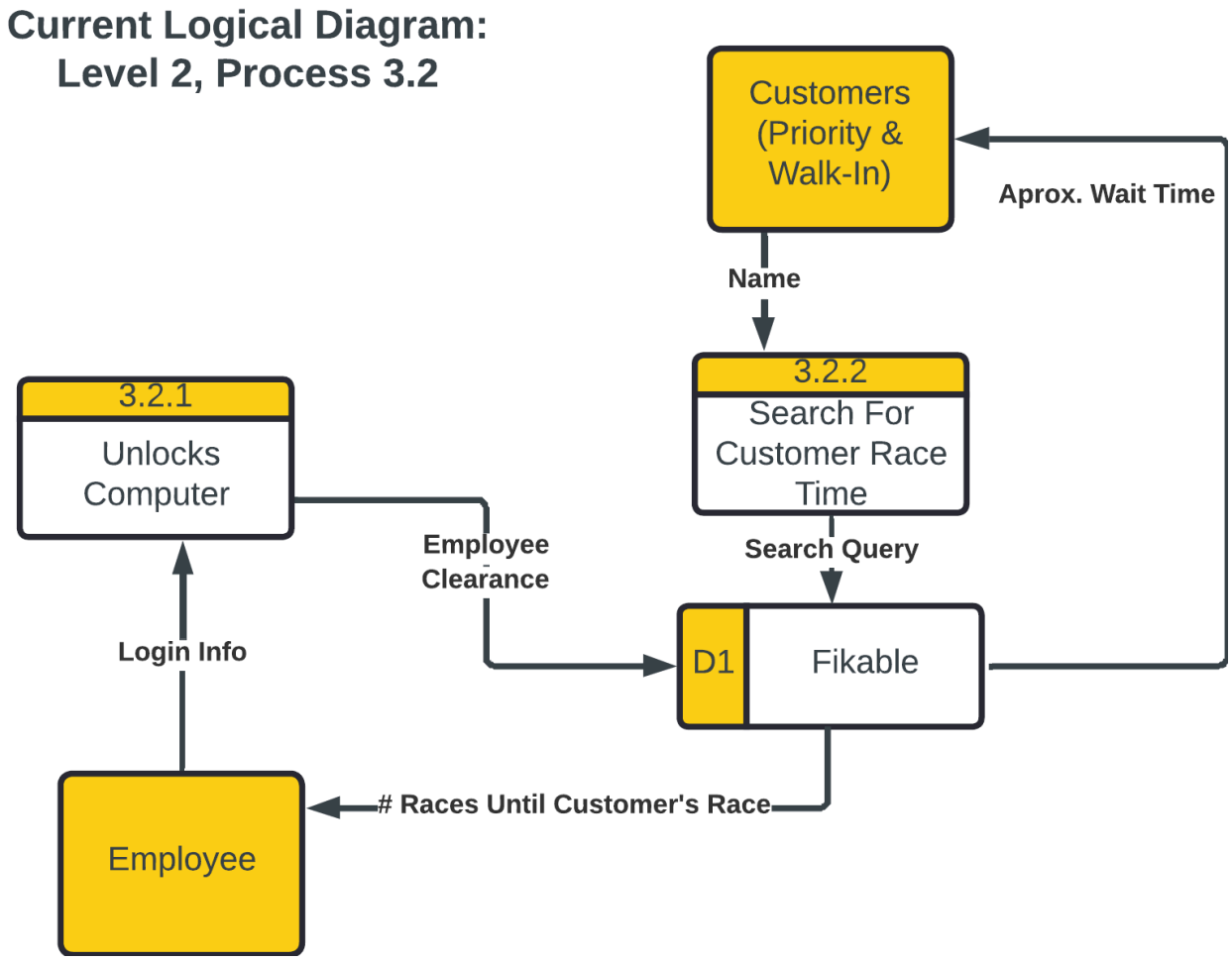
2. Current Logical Diagram Level 1 Process 3



3. Current Logical Diagram Level 1 Process 4



4. Current Logical Diagram Level 2 Process 3.2



5. Current Logical Diagram Level 1 Process 4.2

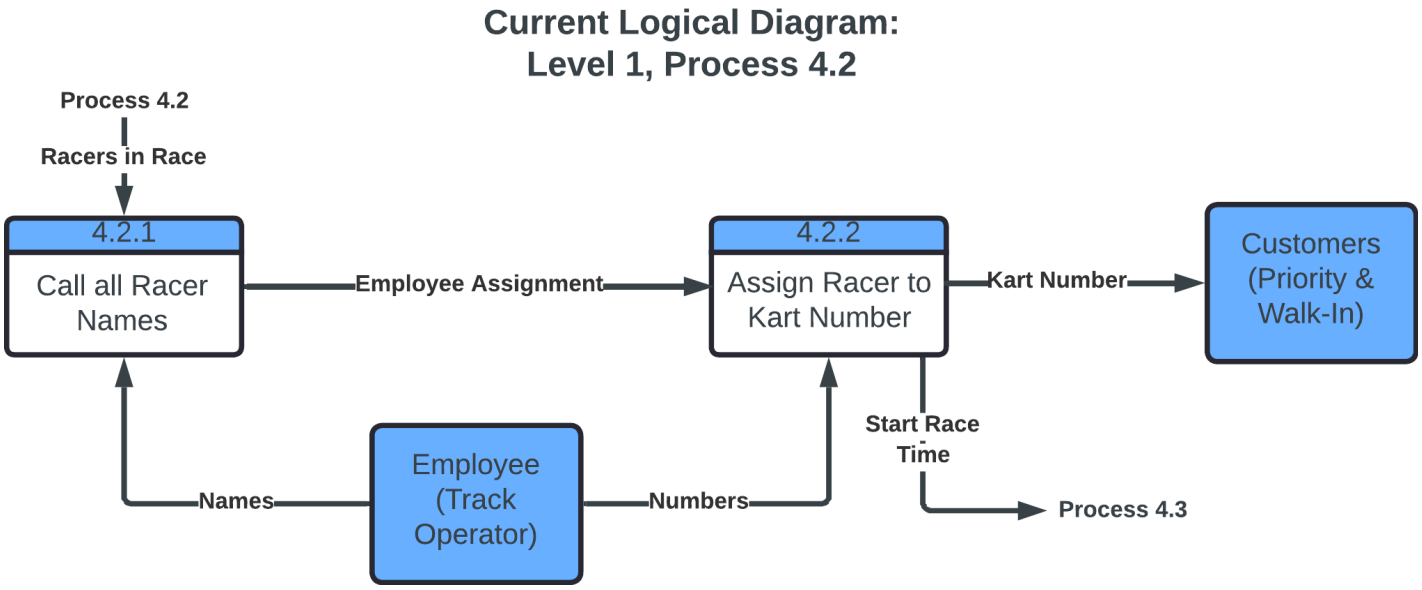


Exhibit D: Current Entity Relationship Diagram

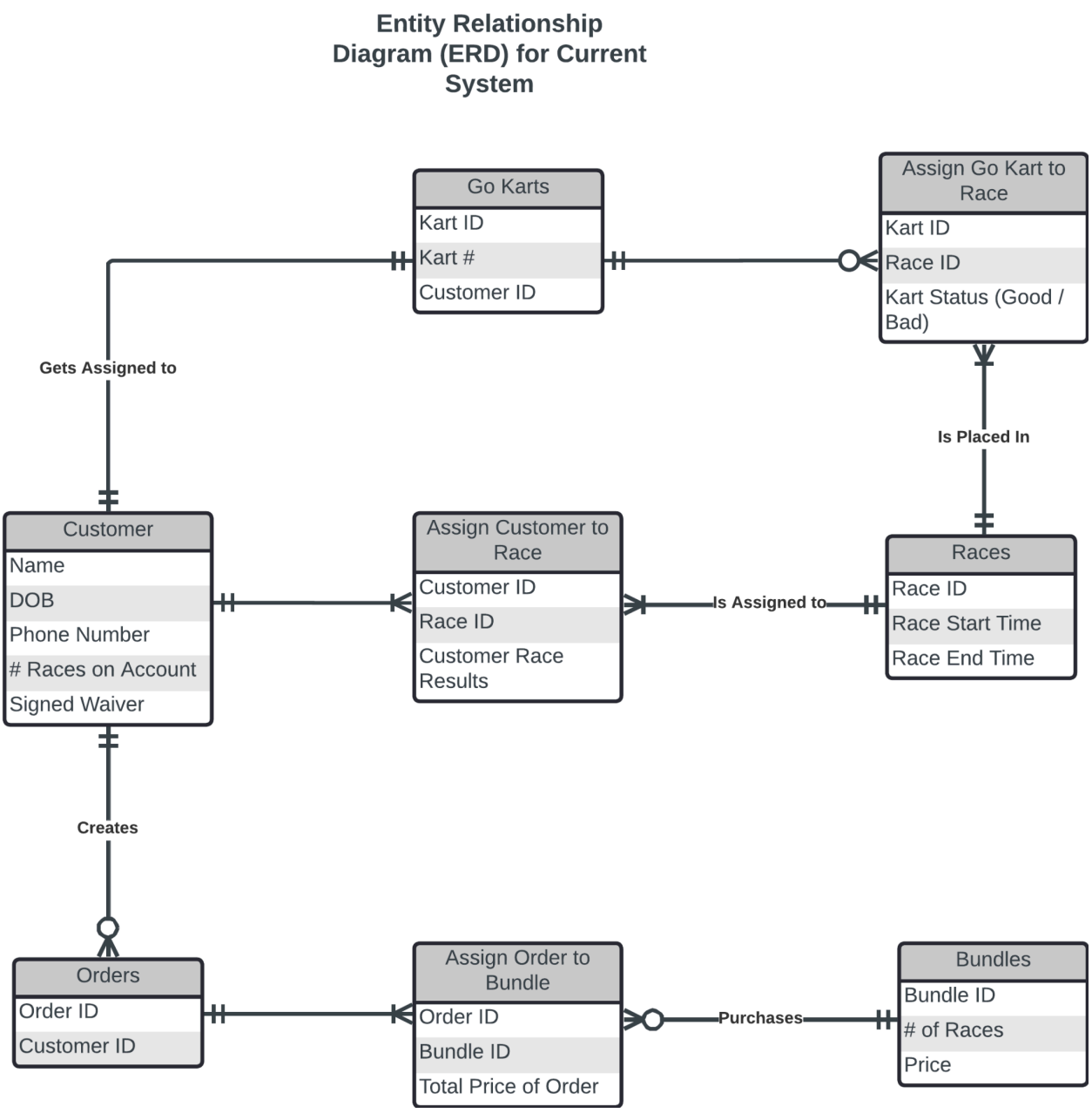
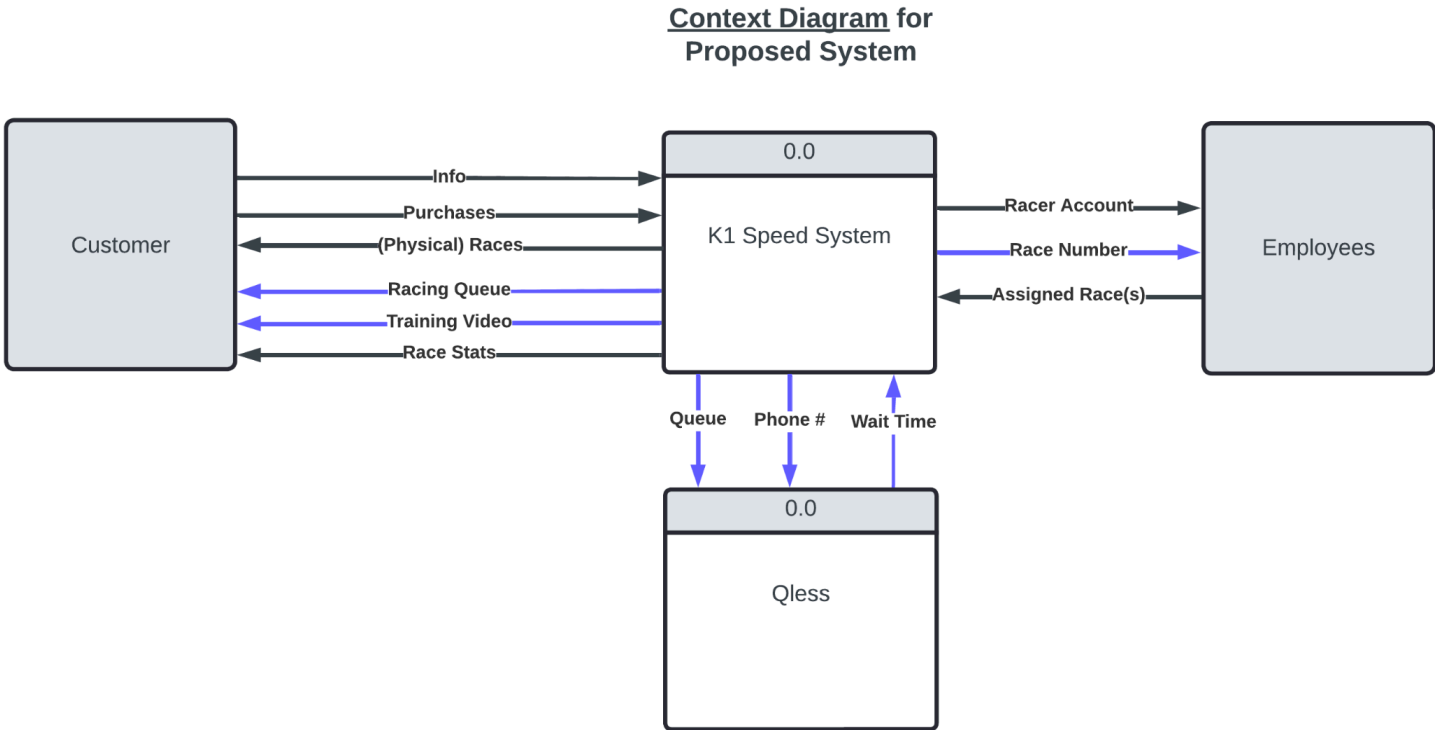
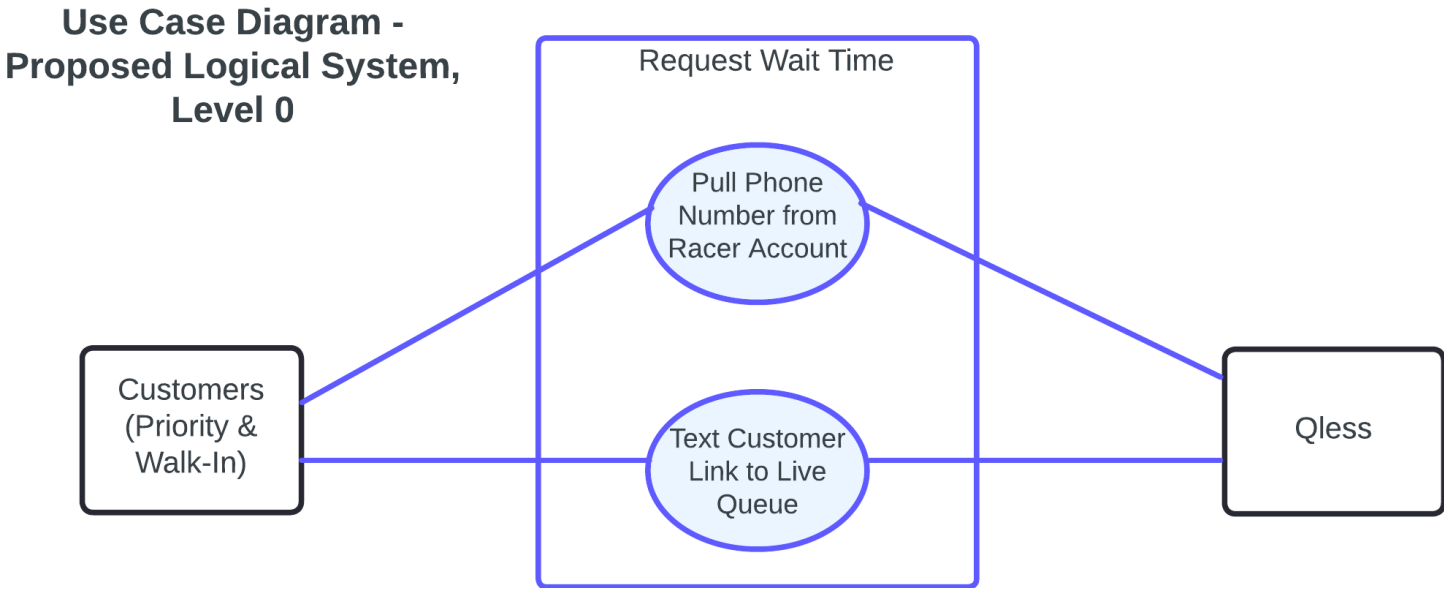


Exhibit E: Proposed Logical Process Models

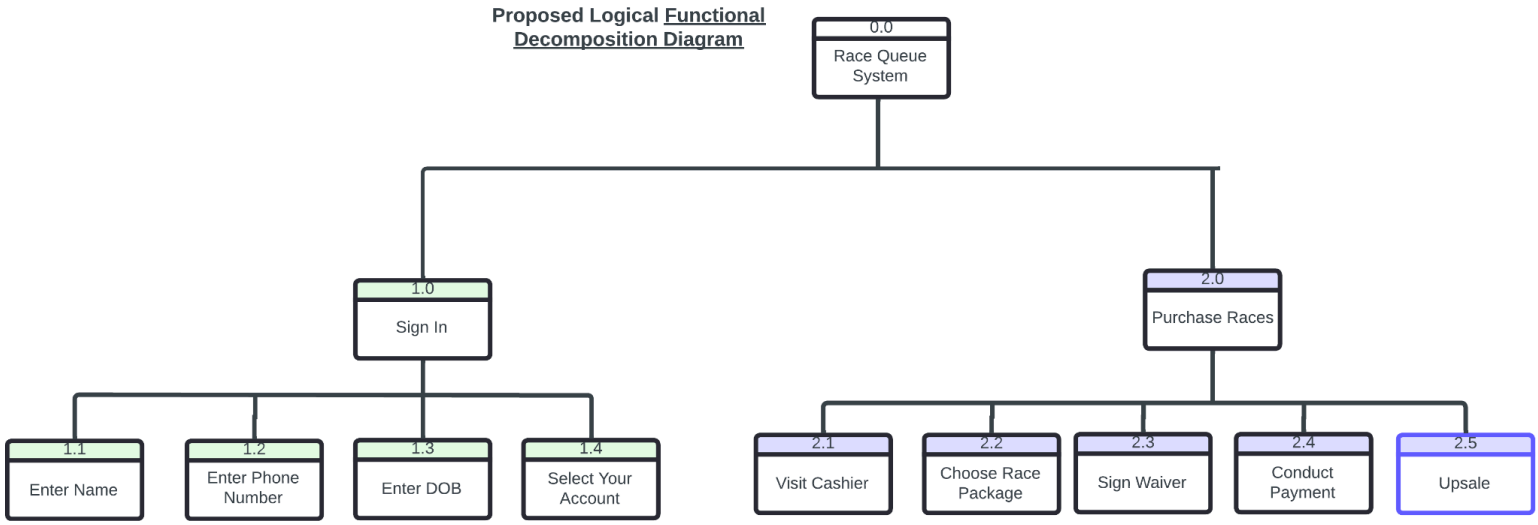
1. Proposed Context Diagram



2. Proposed Logical Use Case Diagram Level 0



3. Proposed Logical Functional Decomposition Diagram

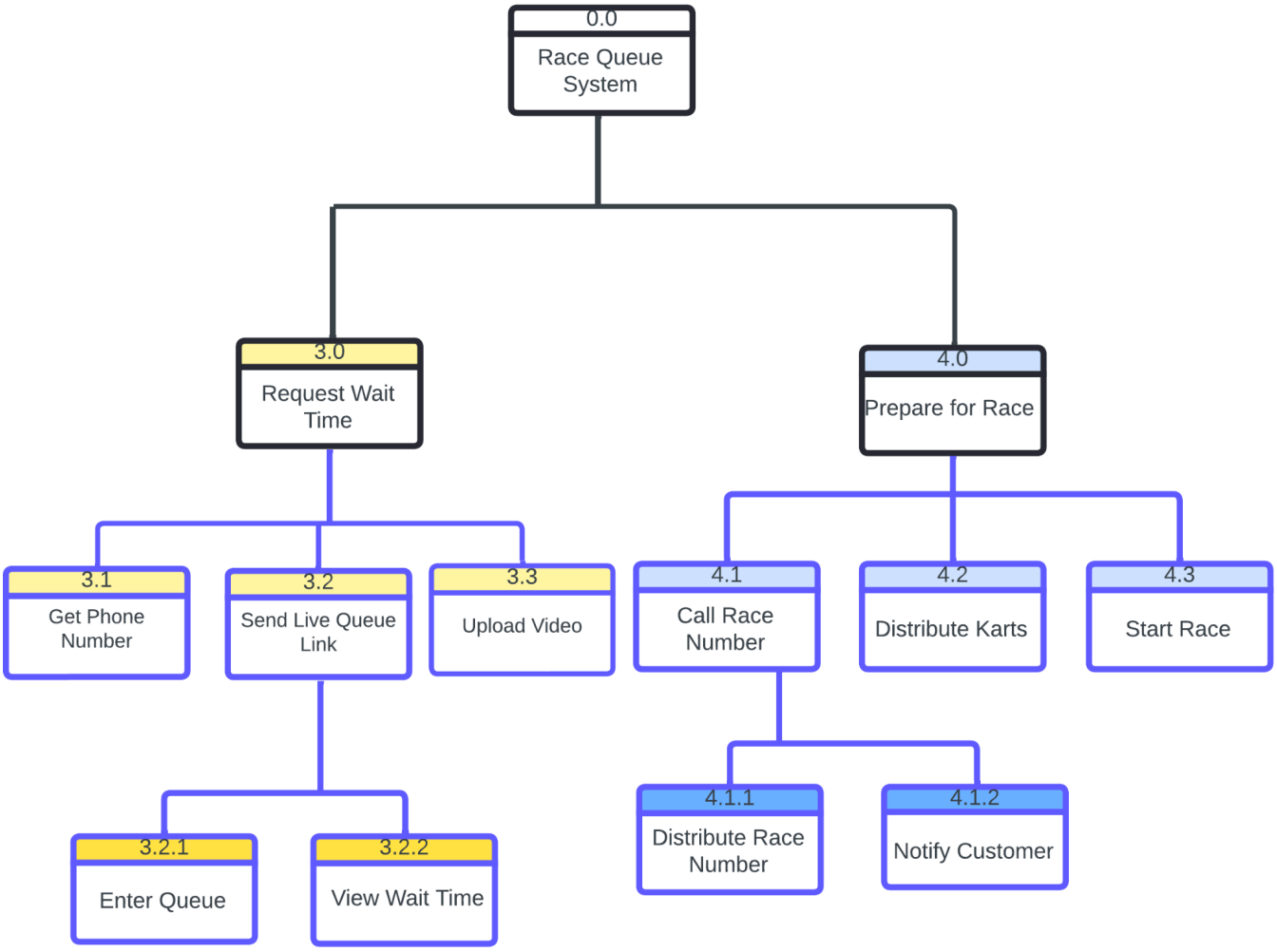


** Due to the width of this diagram, it has been split into 2 parts. See the second half of this diagram on the next page.

**** For process 2.5: The race queue link will also include a page for the customer to add additional races to their account, giving K1 speed more opportunity to upsale.**

3. Proposed Logical Functional Decomposition Diagram Continued

Proposed Logical Functional Decomposition Diagram



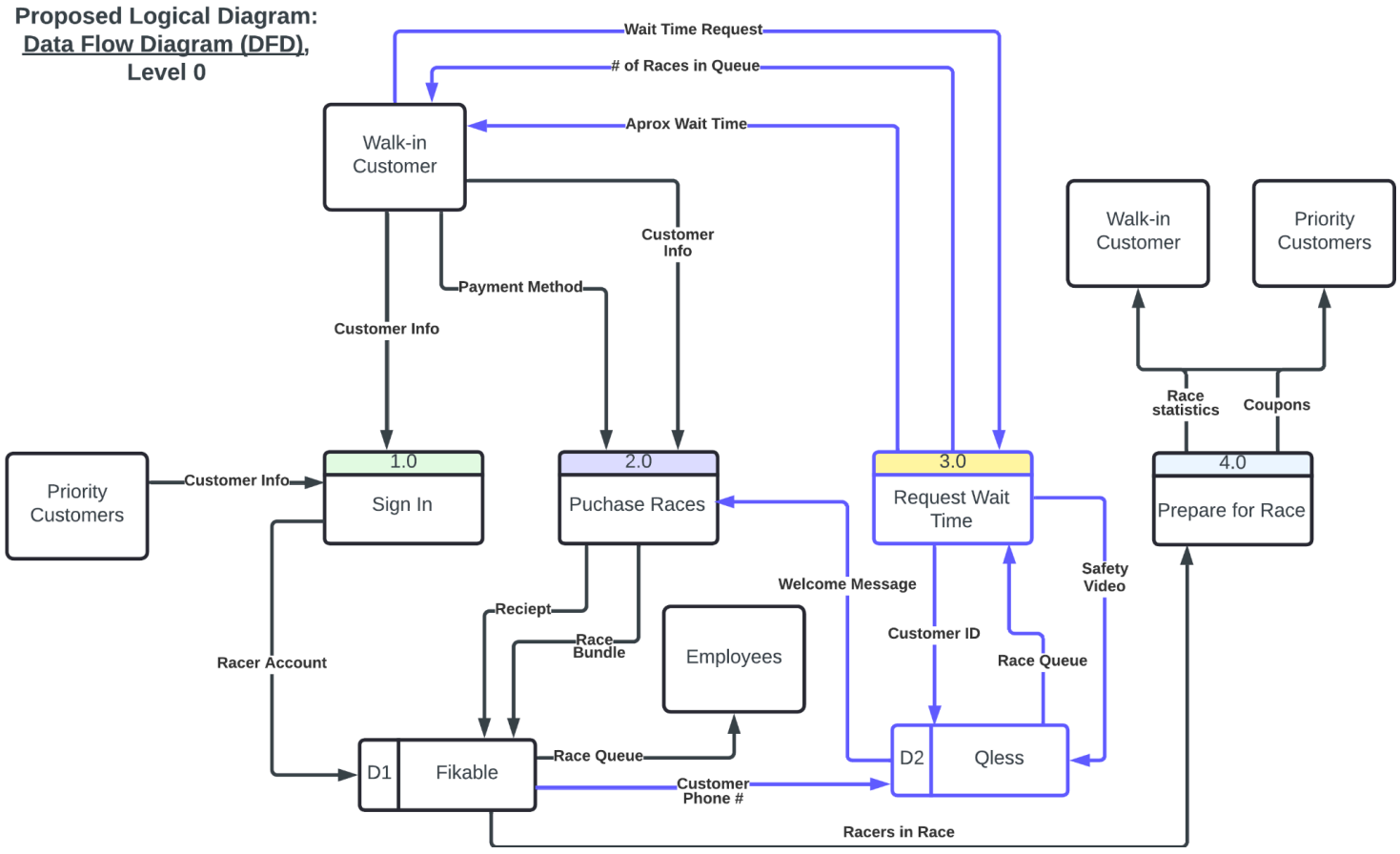
Notes about Exhibit H, figure 3 Continued

****Process 3, Level 1 now reflects the changes made to the Level 0 DFD (Exhibit E.4) by replacing the old processes ("Find Employee" and "Login to Employee Account") with processes that are automated by Fikable and Qless. This same automation also applies to Process 3 level 2, making our proposed system faster.**

****Process 4 Level 2 has been adjusted to limit employee labor, but it is still required. We expect that future updates to this system will push full automation to this section as well, bringing customers to the racing pit more efficiently with little or no employee interaction.**

Racers are now given a Race ID when they checkout, which will also be reflected in the live queue link. When their race is about to start, a notification will be pushed to their phone to line up at the racing pit. This will reduce missed races. Previously, employees had to call every racers name on the intercom, which led to some customers not hearing their name and employees mispronouncing names. Now, customers will be notified via the link and an employee calls out the next Race ID. This will also reduce noise pollution. The intercom echo can be very annoying.

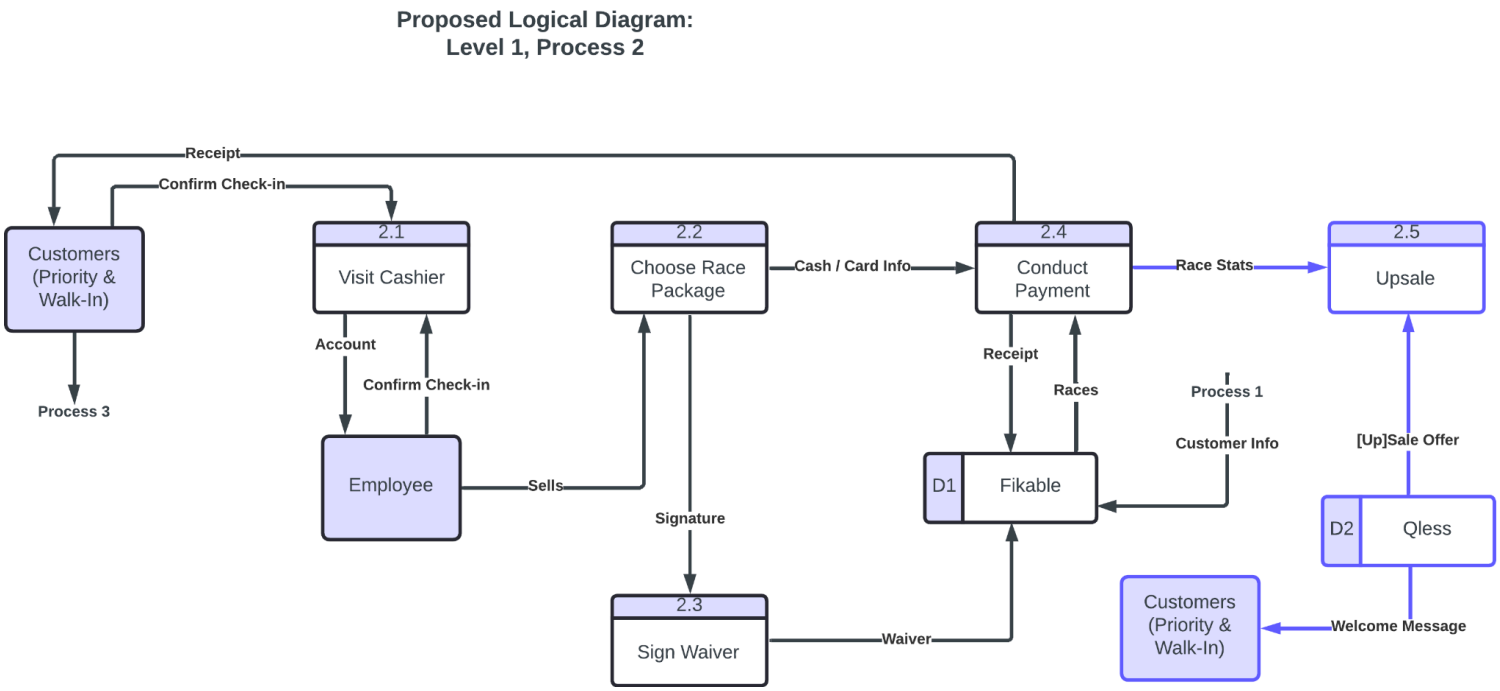
4. Proposed Logical Diagram



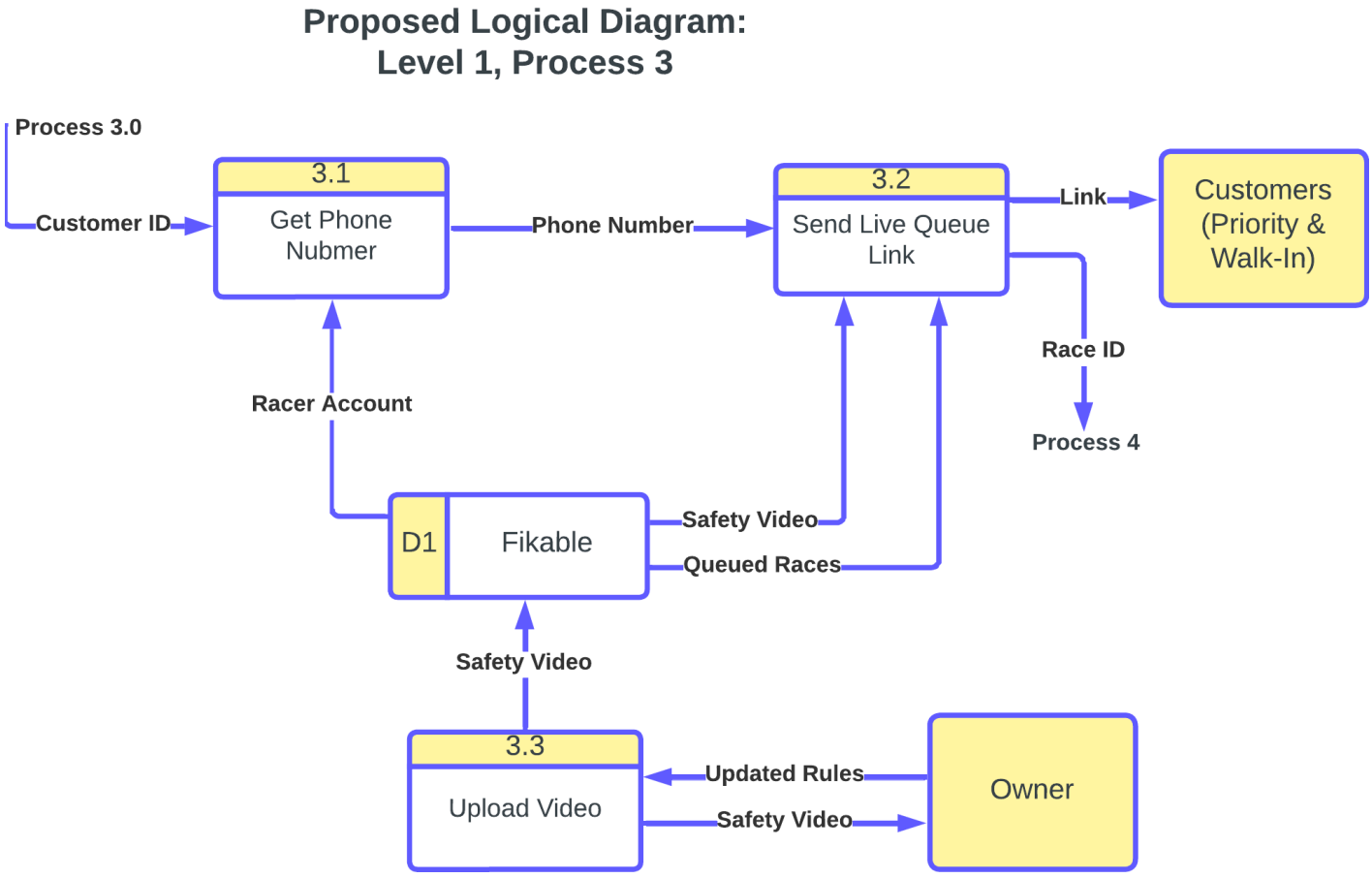
****Process 3 has been changed such that requesting wait time is independent from the Employee entity and now automated by the Qless system.**

Exhibit F: Proposed Logical Diagram Level 1

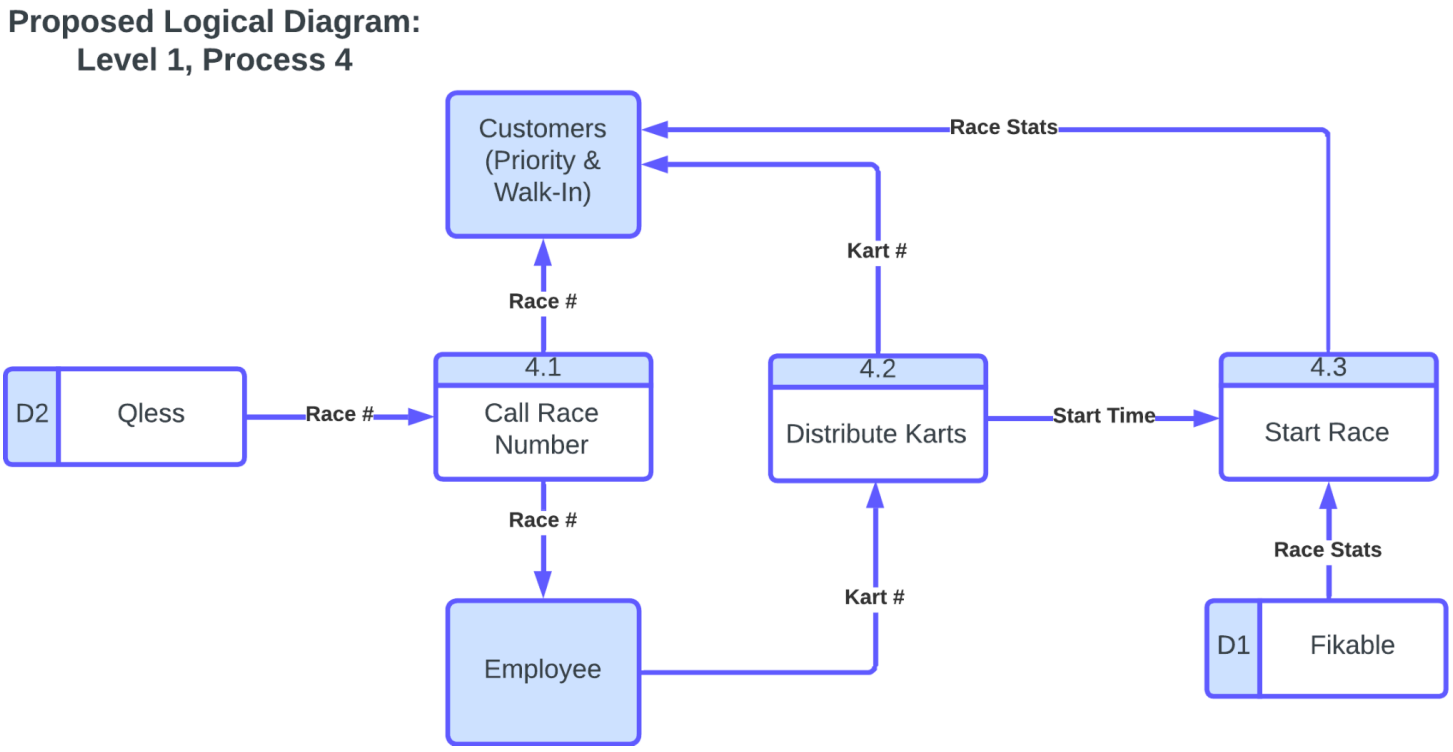
1. Proposed Logical Diagram Level 1 Process 2



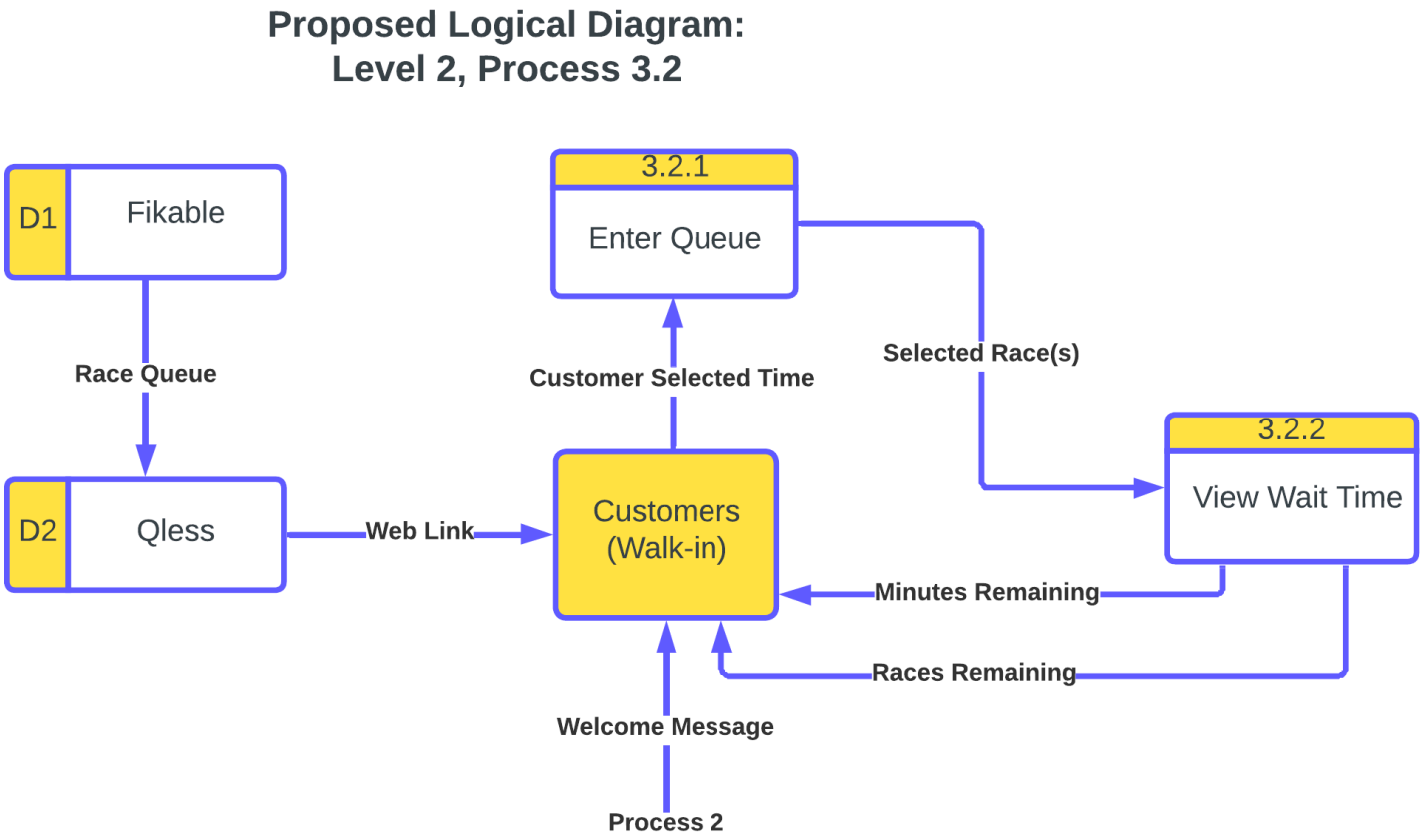
2. Proposed Logical Diagram Level 1 Process 3



3. Proposed Logical Diagram Level 1 Process 4



4. Proposed Logical Level 2 Process 3 diagram



5. Proposed Logical Diagram Level 2 Process 4

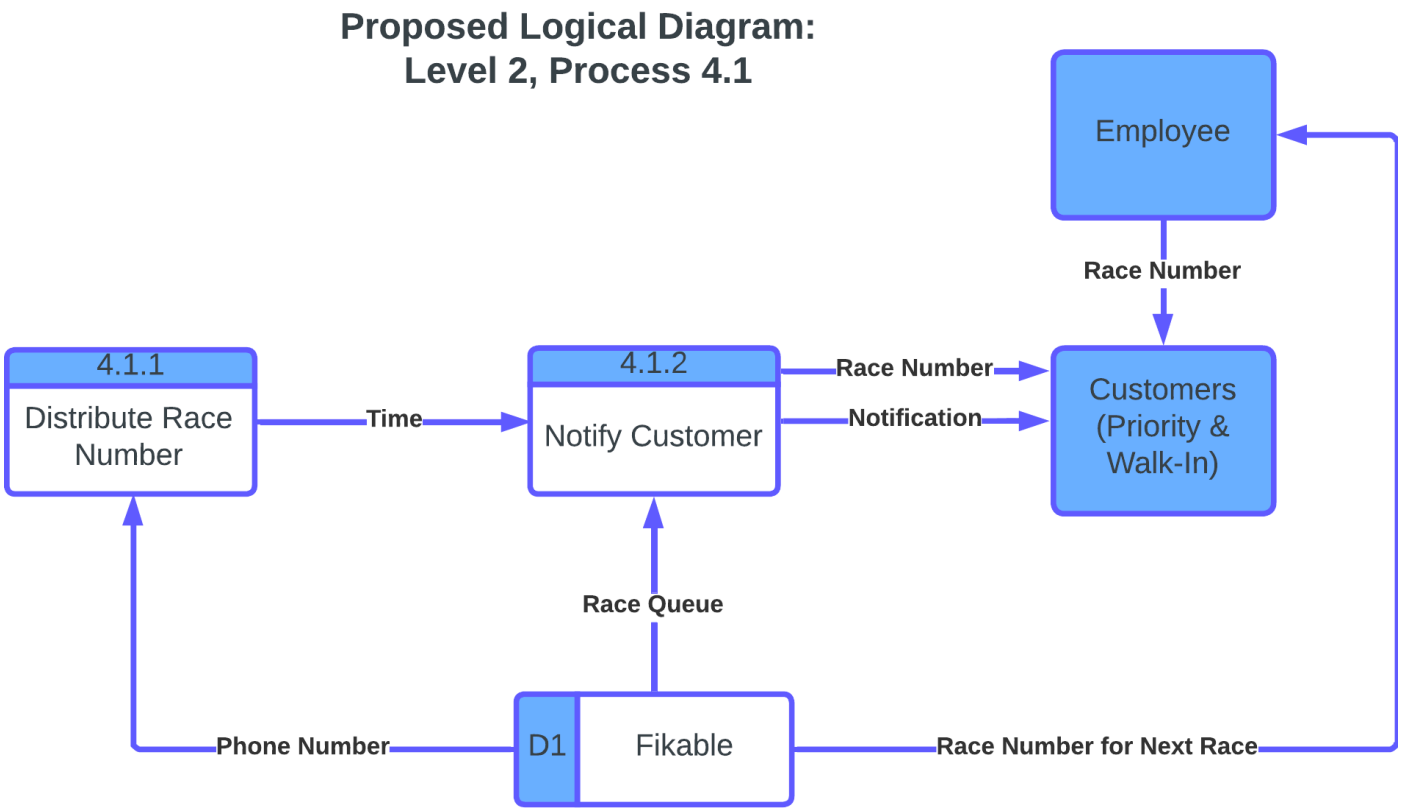
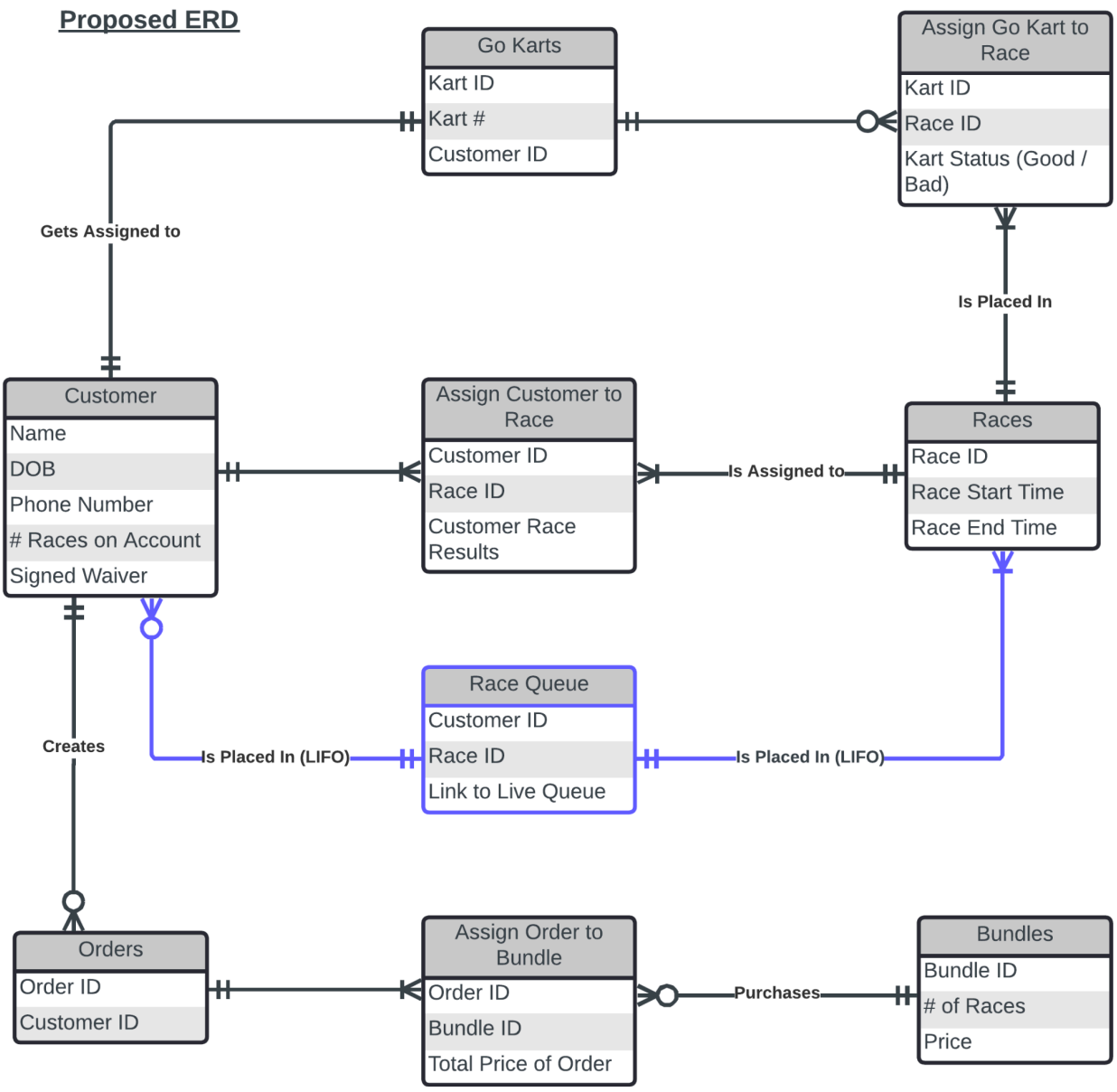


Exhibit G: Proposed Entity Relationship Diagram

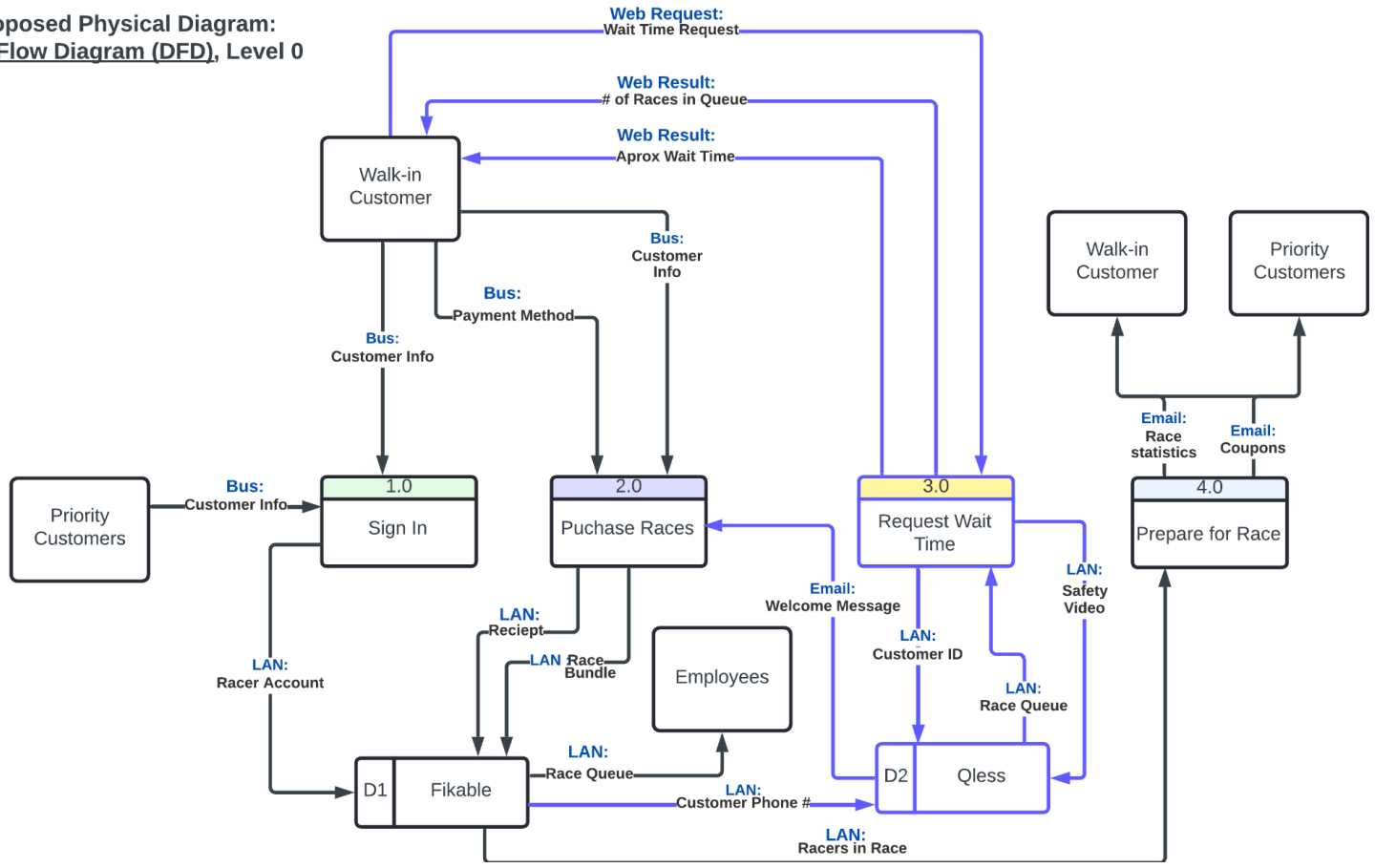


****All entities beginning with "Assign" are Associative entities and are necessary to improve SQL compatibility and better support referential integrity. Furthermore, entities "Assign Customer to Race" and "Race Queue" may be combined depending on K1 Speed's implementation of the Qless.**

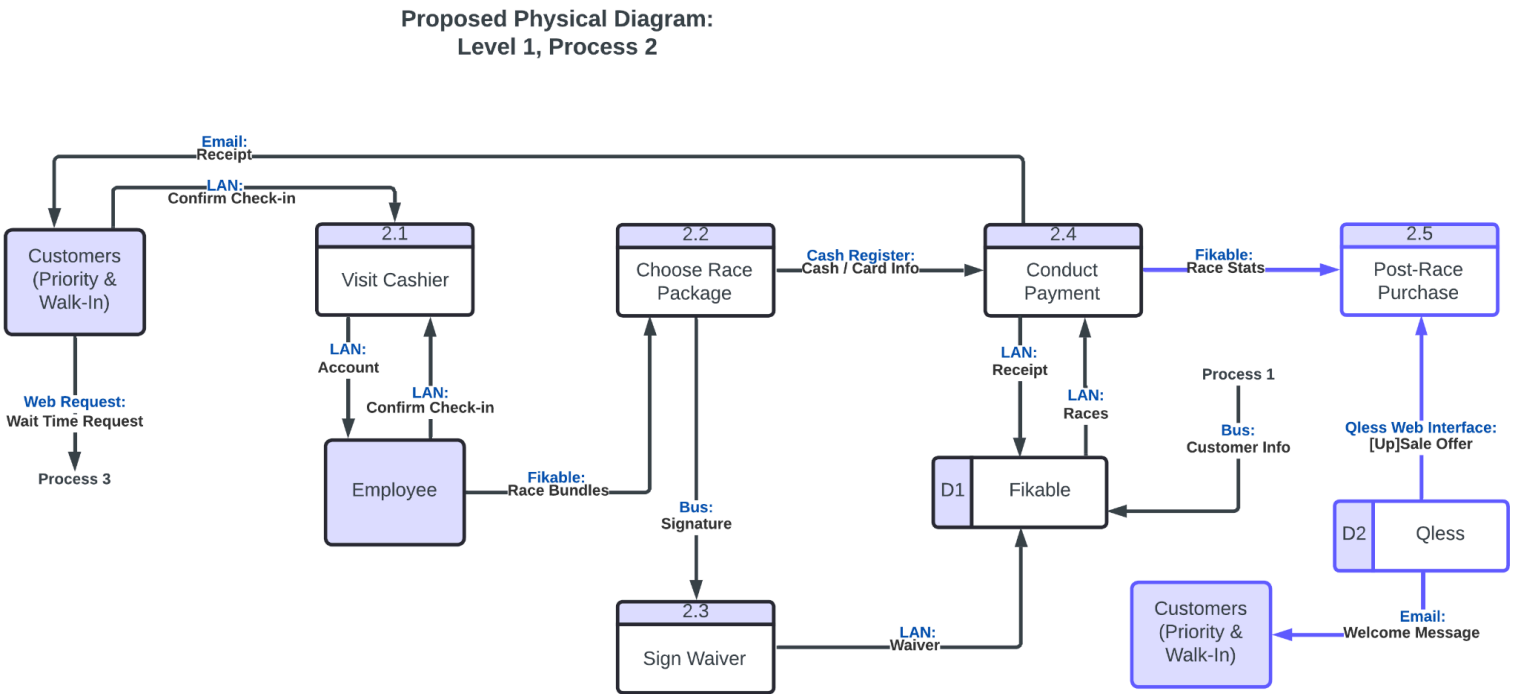
EXHIBIT H: Proposed Physical Models

1. Data Flow Diagram Level 0

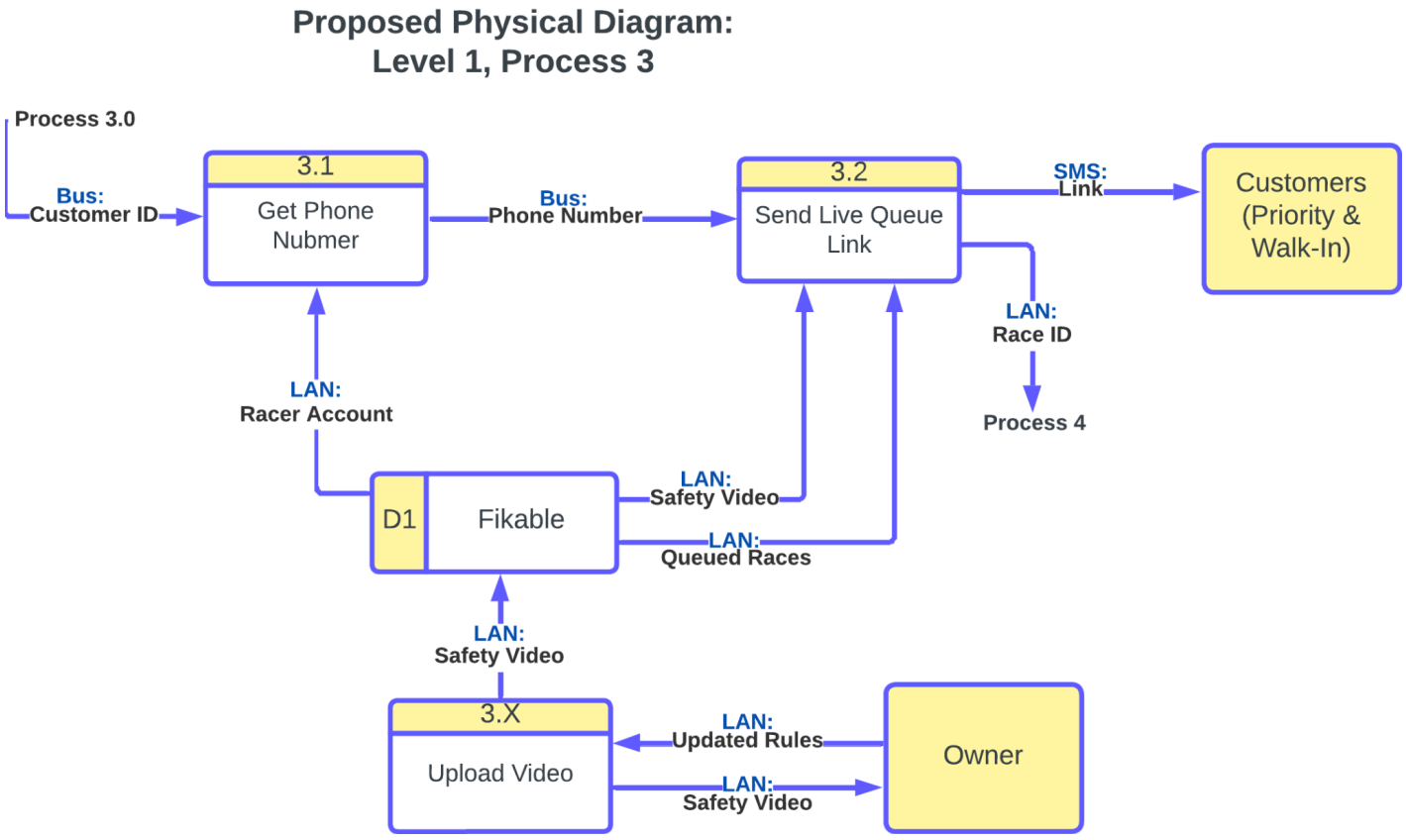
Proposed Physical Diagram:
Data Flow Diagram (DFD), Level 0



2. Level 1 Process 2



3. Level 3 Process 3



4. Level 1 Process 4

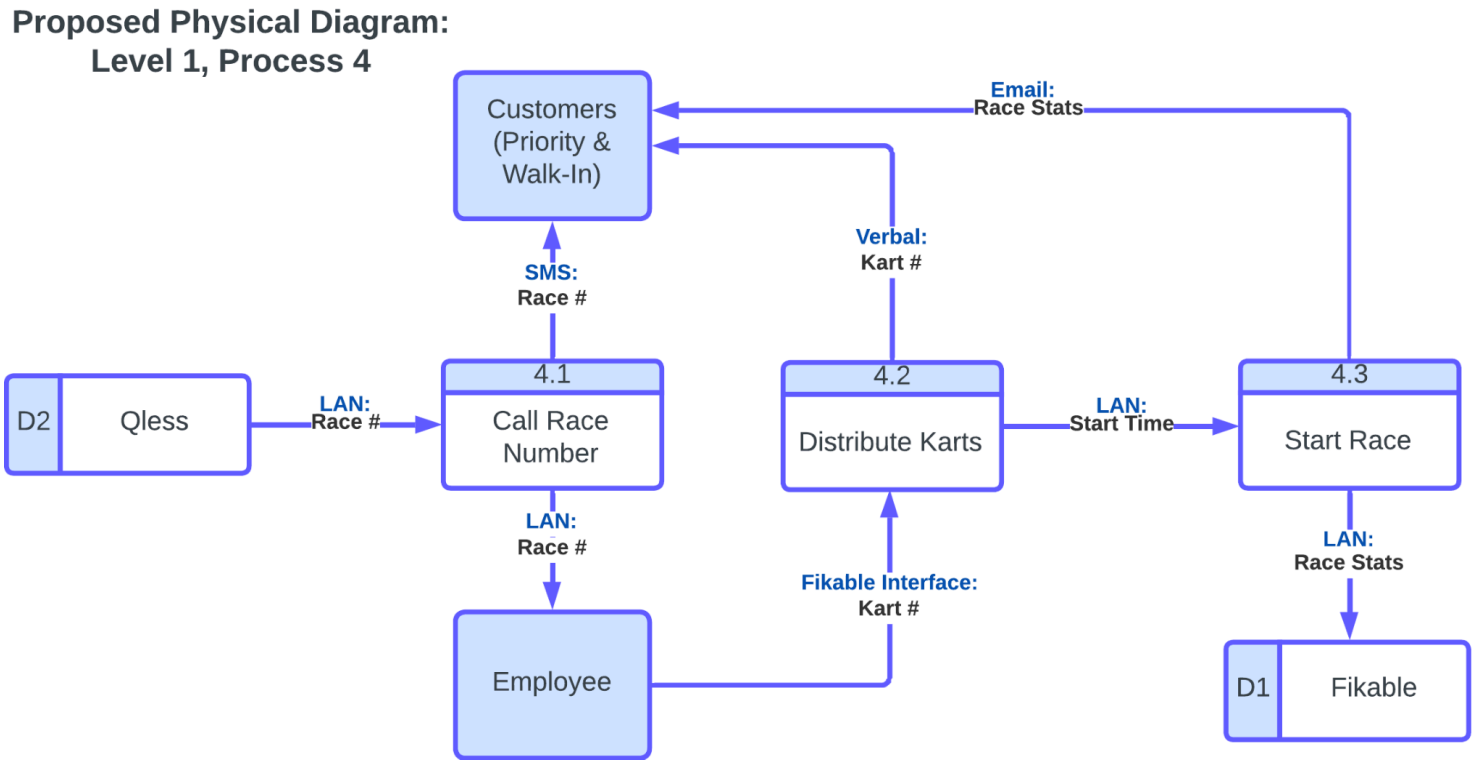
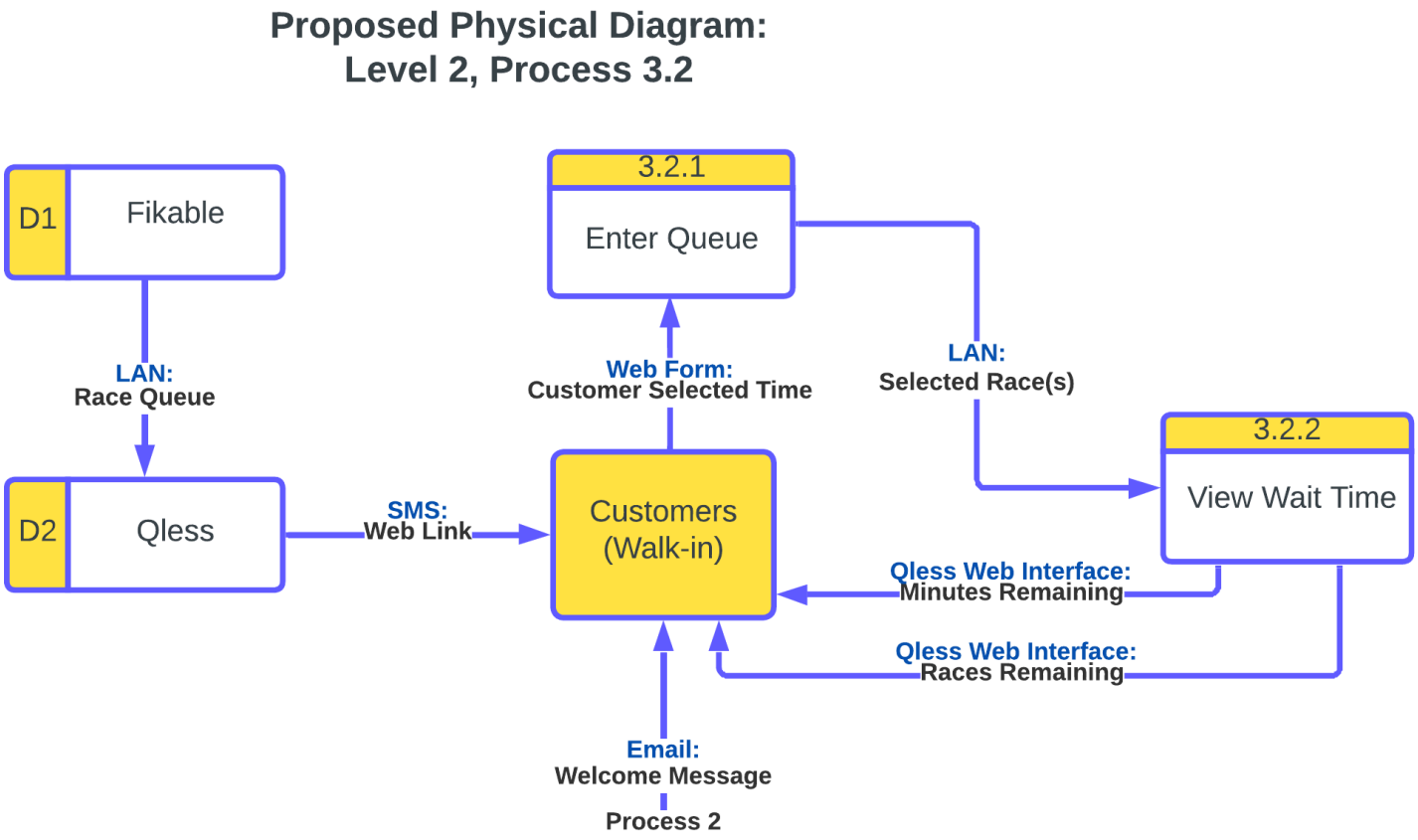


EXHIBIT I: Proposed Physical Models Level 2

1. Level 2 Process 3



2. Level 2 Process 4.1

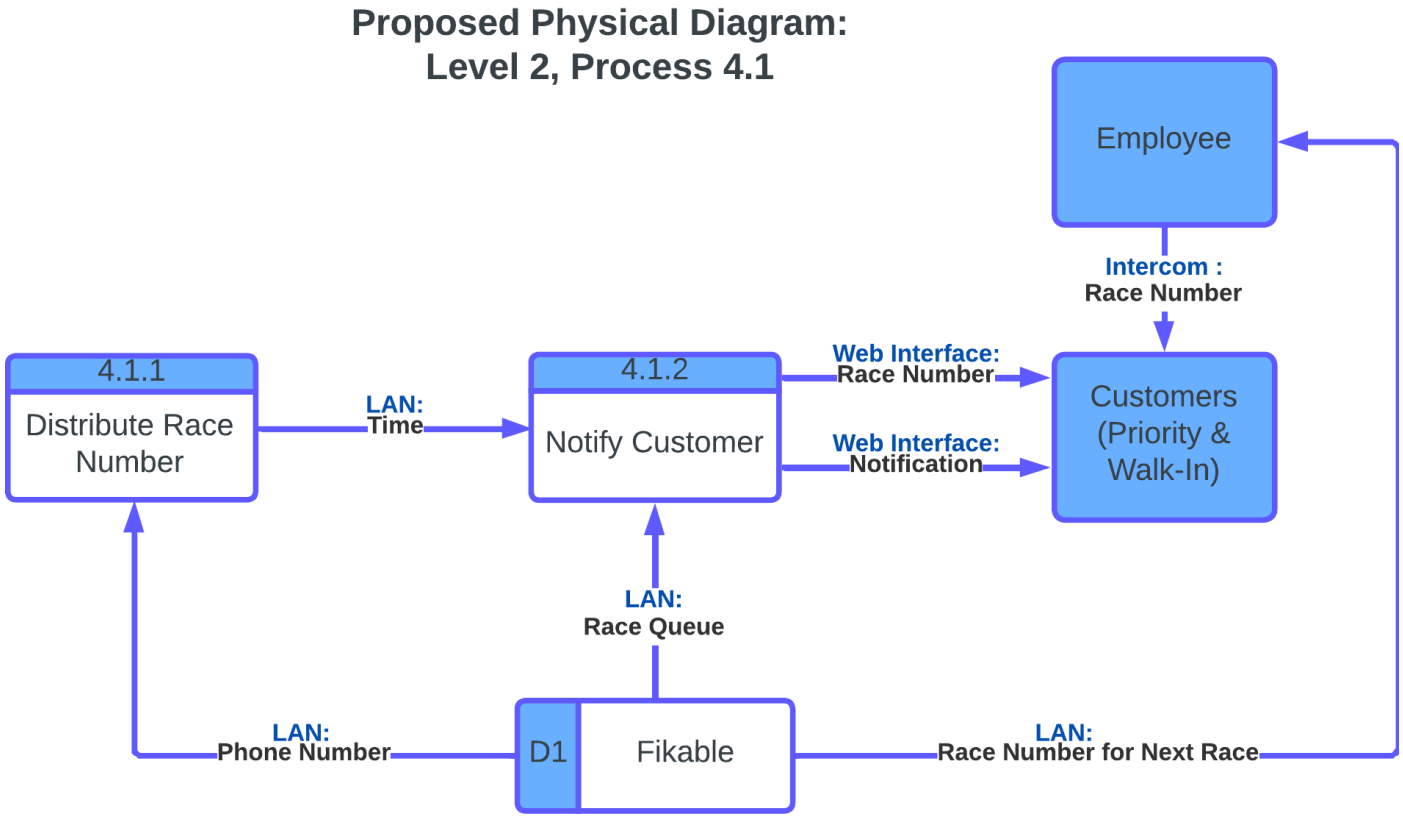
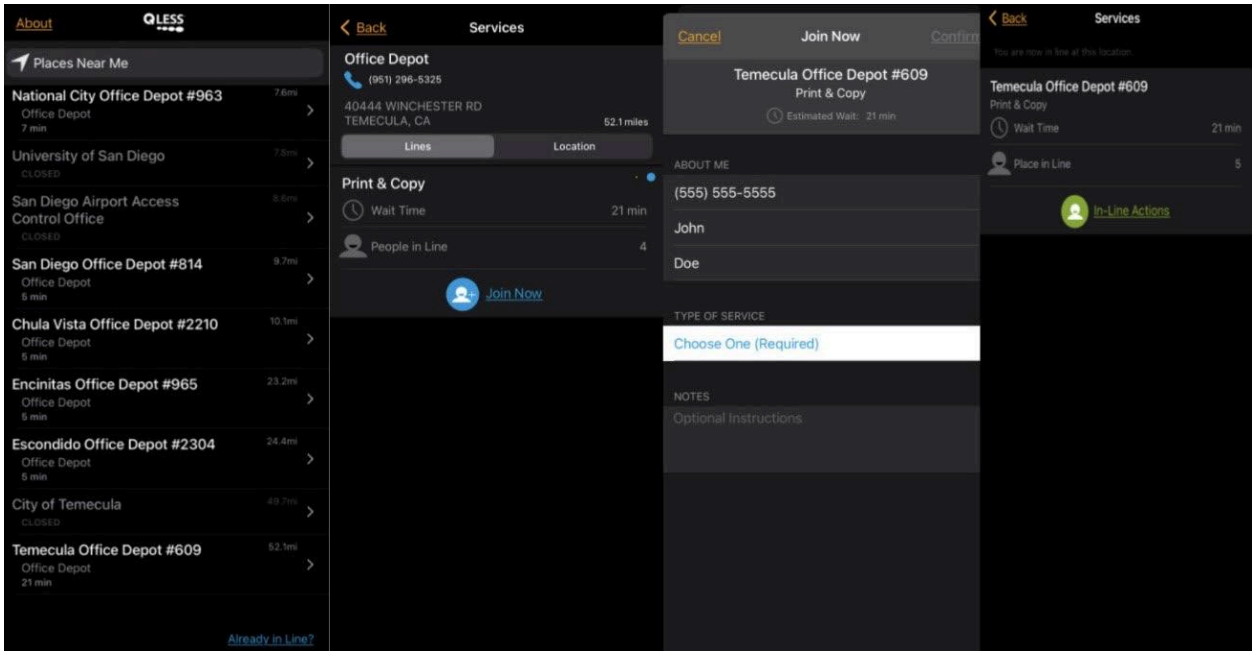


Exhibit J: QLess

1. User Interface



2. Dashboard

* From QLess's YouTube Channel

Exhibit K: PIECES Chart

	Performance	Information	Economics	Control	Efficiency	Service
Performance	1. How fast is data processed? 2. What is the average wait time?	1. Are the wait times accurate 2. Where is the data stored?				
Software	1. How many request can the application serve?		1. How much does the current software cost monthly?			
Processes	1. How many complaints are caused by the current queuing system?		1. How many refunds do you issue? 2. Average refund amount?		1. How well does the current system handle changes or updates?	1. How many customers return?
People					1. How well do employees like the current system?	

*Type of questions team 13 asked during initial interview to get a better understanding of system and scope

Exhibit L: Financial Feasibility Calculations

K1 Speed Carlsbad
Economic Feasibility Analysis
Race Queue Project

		Year of Project					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Net economic benefit	$ -	$ 36,208	$ 36,208	$ 36,208	$ 36,208	$ 36,208	
Discount Rate	5%						
PV of Benefits	$ -	$ 34,484	$ 32,842	$ 31,278	$ 29,788	$ 28,370	
NPV of all benefits	$ -	$ 34,484	$ 67,326	$ 98,603	$ 128,392	$ 156,762	**$ 156,762**
One time cost	$ (10,000)	**<-- Aprox. cost of Fikable Programmers to modify system for Qless (GUESS)**					
Recurring Cost	$ -	$ (10,920)	$ (10,920)	$ (10,920)	$ (10,920)	$ (10,920)	
Discount Rate	5%						
PV of Recurring Costs		$ (10,400)	$ (9,905)	$ (9,433)	$ (8,984)	$ (8,556)	
NPV of all Costs	$ (10,000)	$ (20,400)	$ (30,305)	$ (39,738)	$ (48,722)	$ (57,278)	**$ (57,278)**
Overall NPV							**$ 99,484**
Overall ROI = (Overall NPV / NPV of All Costs)							**1.74**
Break Even Analysis							
Yearly NPV Cash Flow	$ (10,000)	$ 24,084	$ 22,937	$ 21,845	$ 20,805	$ 19,814	
Overall NPV Cash Flow	$ (10,000)	$ 14,084	$ 37,021	$ 58,865	$ 79,670	$ 99,484	
Project break-even occures between:						Year 0 - 1	
Use first year of positive cash flow to calculste break even fraction:						Year 1	
Actural break even Occured at:						152	Days

** The Excel Spreadsheet was created with dynamic formulas. If edits are necessary, please download the file below.

K1 Speed Economic Feasability Analysis

K1 Speed (32 Domestic Locations)
Economic Feasibility Analysis
Race Queue Project

			Year of Project				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Net economic benefit	$ -	$ 1,158,656	$ 1,158,656	$ 1,158,656	$ 1,158,656	$ 1,158,656	
Discount Rate	5%						
PV of Benefits	$ -	$ 1,103,482	$ 1,050,935	$ 1,000,891	$ 953,229	$ 907,837	
NPV of all benefits	$ -	$ 1,103,482	$ 2,154,417	$ 3,155,308	$ 4,108,537	$ 5,016,374	**$ 5,016,374**
One time cost	$ (10,000)	**<-- Aprox. cost of Fikable Programmers to modify system for Qless (GUESS)**					
Recurring Cost	$ -	$ (349,440)	$ (349,440)	$ (349,440)	$ (349,440)	$ (349,440)	
Discount Rate	5%						
PV of Recurring Costs		$ (332,800)	$ (316,952)	$ (301,859)	$ (287,485)	$ (273,795)	
NPV of all Costs	$ (10,000)	$ (342,800)	$ (659,752)	$ (961,612)	$ (1,249,097)	$ (1,522,892)	**$ (1,522,892)**
Overall NPV							**$ 3,493,482**
Overall ROI = (Overall NPV / NPV of All Costs)							**2.29**
Break Even Analysis							
Yearly NPV Cash Flow	$ (10,000)	$ 770,682	$ 733,983	$ 699,031	$ 665,744	$ 634,042	
Overall NPV Cash Flow	$ (10,000)	$ 760,682	$ 1,494,665	$ 2,193,696	$ 2,859,440	$ 3,493,482	
Project break-even occures between:						Year 0 - 1	
Use first year of positive cash flow to calculste break even fraction:						Year 1	
Actural break even Occured at:						5	Days

K1 Speed Carlsbad
Economic Feasibility Analysis
Race Queue Project

			Year of Project				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Net economic benefit	$ -	$ 36,208	$ 36,208	$ 36,208	$ 36,208	$ 36,208	
Discount Rate	5%						
PV of Benefits	$ -	=pv($B$8,1,-C7,,0)	=pv($B$8,2,-D7,,0)-C9	=pv($B$8,3,-E7,,0)-D9-C9	=pv($B$8,4,-F7,,0)-E9-D9-C9	=pv($B$8,5,-G7,,0)-F9-E9-D9-C9	
NPV of all benefits	$ -	=pv($B$8,1,-C7,,0)	=pv($B$8,2,-D7,,0)	=pv($B$8,3,-E7,,0)	=pv($B$8,4,-F7,,0)	=pv($B$8,5,-G7,,0)	**=G11**
One time cost	$ (10,000)	**<-- Aprox. cost of Fikable Programmers to modify system for Qless (GUESS)**					
Recurring Cost	$ -	$ (10,920)	$ (10,920)	$ (10,920)	$ (10,920)	$ (10,920)	
Discount Rate	=B8						
PV of Recurring Costs		=PV($B$16,1,-C15,,0)	=PV($B$16,2,-D15,,0)-C17	=PV($B$16,3,-E15,,0)-D17-C17	=PV($B$16,4,-F15,,0)-E17-D17-C17	=PV($B$16,5,-G15,,0)-F17-E17-D17-C17	
NPV of all Costs	=B13	=pv($B$16,1,-C15,,0)+$B$19	=pv($B$16,2,-D15,,0)+$B$19	=pv($B$16,3,-E15,,0)+$B$19	=pv($B$16,4,-F15,,0)+$B$19	=pv($B$16,5,-G15,,0)+$B$19	**=G19**
Overall NPV							**=H11+H19**
Overall ROI = (Overall NPV / NPV of All Costs)							**=H22/-H19**
Break Even Analysis							
Yearly NPV Cash Flow	=B13	=C9+C17	=D9+D17	=E9+E17	=F9+F17	=G9+G17	
Overall NPV Cash Flow	=B13	=C11+C19	=D11+D19	=E11+E19	=F11+F19	=G11+G19	
Project break-even occures between:						Year 0 - 1	
Use first year of positive cash flow to calculste break even fraction:						Year 1	
Actural break even Occured at:						=(1-C30/C29)*365	Days

Team 13 Post Mortem:

As a team, we undertook the task of proposing and analyzing the implementation of QLess, a digital queuing system, at K1 Speed's Carlsbad location. Our goal was to address the challenges of managing customer flow, reducing wait times, and enhancing overall customer satisfaction. After thorough research and analysis, we presented our findings and recommendations to the management team at K1 Speed.

Our process began with extensive research into K1 Speed's current challenges and customer feedback. We conducted interviews with staff, and researched potential solutions. QLess emerged as the most promising solution due to its ability to provide real-time updates, improve customer communication, and streamline operations.

Once we identified QLess as the solution, we divided tasks among team members based on individual strengths and expertise. We collaborated closely throughout the project, sharing insights, feedback, and progress updates. We conducted cost-benefit analyses, developed implementation plans, and crafted the executive summary and conclusion.

While our teamwork was generally effective, we encountered a few challenges along the way. One challenge was coordinating schedules for team meetings and work sessions, especially with different members having conflicting commitments. We addressed this by setting clear deadlines and utilizing online collaboration tools to facilitate communication.

Another challenge was obtaining accurate data and projections for the cost and ROI of implementing QLess. We had to rely on estimates and assumptions, which introduced some uncertainty into our analysis. To mitigate this, we conducted thorough research, primarily through interviews with representatives from each respective company.

Despite these challenges, our team achieved several successes throughout the project. We successfully researched, analyzed, and presented a comprehensive solution to K1 Speed's customer flow challenges. Our executive summary effectively communicated the benefits of implementing QLess, including potential ROI and improvements in customer satisfaction.

We also successfully collaborated as a team, leveraging each member's strengths to produce a cohesive and well-rounded proposal. Our division of tasks allowed us to work efficiently and leverage each member's expertise to address different aspects of the project.

Throughout the project, we learned valuable lessons that will inform our future teamwork and projects. Effective communication and coordination are essential for successful collaboration, especially when team members have varying schedules and commitments. Clear deadlines, regular check-ins, and transparent communication channels are crucial for keeping everyone on track and ensuring accountability.

Additionally, we learned the importance of thorough research and data analysis in making informed decisions and recommendations. While estimates and assumptions are sometimes necessary, it's essential to validate them as much as possible and document the reasoning behind them.

In conclusion, our team successfully proposed and analyzed the implementation of QLess at K1 Speed. While we encountered some challenges along the way, we overcame them through effective teamwork, thorough research, and clear communication. We believe that our recommendations have the potential to significantly improve customer satisfaction, reduce wait times, and drive growth for K1 Speed. Moving forward, we will apply the lessons learned from this project to future endeavors, ensuring continued success and collaboration.