



APEC WATER®

ISYS2128: Digital Business Design and Innovation



ASSESSMENT 3: PART 3 - PROTOTYPE PRESENTATION

# APEC WATER'S TECHNOLOGY SOLUTION

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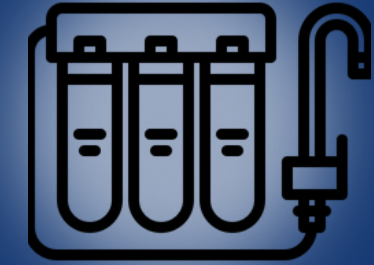


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# ABOUT APEC WATER

- Leader in reverse osmosis (RO) water filtration system.
- Based in USA 
- Provides high-quality water purification solutions.



Despite the reputation in the industry, APEC Water still faces **ISSUES**

## 1. Human Resources

- **High Turnover Rate**
  - Skill Gaps
  - Insufficient Training
  - Poor Communication
- **Communication Gaps**
  - Inter-departmental Inefficiencies
  - Weak customer Interactions

## 2. Inefficient Processes

- **Manual Operations**
  - Lack of automation
  - Manual data entry
- **Supply Chain Issues**
  - No in-house logistics
  - Outdated inventory tracking
- **Quality Compliance**
  - Standard non-compliance
  - No proactive error detection





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# TECHNOLOGY SOLUTION RECOMMENDED

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## Centralized System (Oracle NetSuite)

- **Role-based training and task automation** to reduce workload and improve job satisfaction.
- **Real-time inventory updates** and automated alerts for **better communication**.

## Process Optimization

- **Streamlined packing, order verification, and compliance checks** with automation.
- **Enhanced customer experience** with order tracking and real-time notifications.

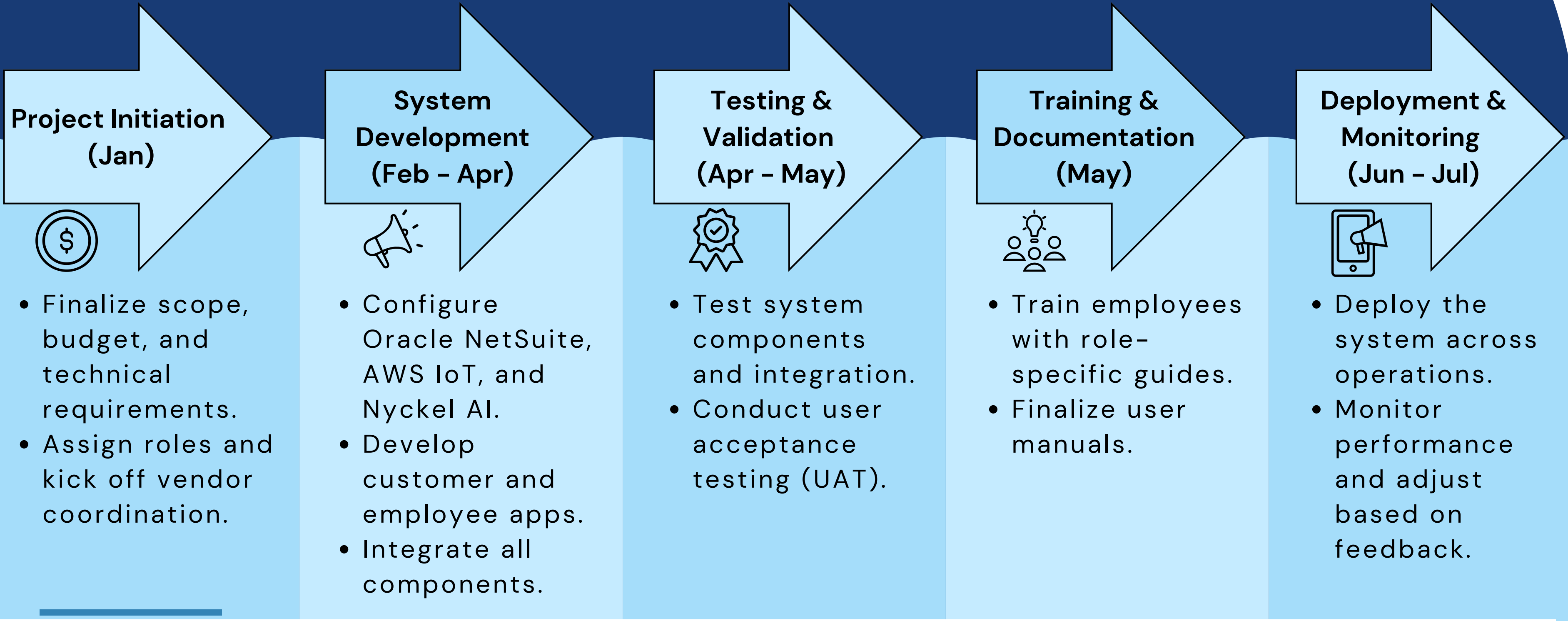
**ORACLE®**  
NETSUITE



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# KEY MILESTONES



## Project Initiation (Jan)



- Finalize scope, budget, and technical requirements.
- Assign roles and kick off vendor coordination.

## System Development (Feb - Apr)



- Configure Oracle NetSuite, AWS IoT, and Nyckel AI.
- Develop customer and employee apps.
- Integrate all components.

## Testing & Validation (Apr - May)



- Test system components and integration.
- Conduct user acceptance testing (UAT).

## Training & Documentation (May)



- Train employees with role-specific guides.
- Finalize user manuals.

## Deployment & Monitoring (Jun - Jul)



- Deploy the system across operations.
- Monitor performance and adjust based on feedback.

Overview

Architecture design

Website

Implementation

Change Management



# COST-BENEFIT ANALYSIS

## TOTAL COST

Cost analysis						
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>Non-recurring costs</b>						
ERP Initial Setup and Configuration	\$47,000	\$0	\$0	\$0	\$0	\$47,000
IoT Devices Setup	\$10,000	\$0	\$0	\$0	\$0	\$10,000
Consulting Services	\$20,000	\$0	\$0	\$0	\$0	\$20,000
Database Setup	\$8,000	\$0	\$9,000	\$0	\$10,000	\$27,000
Hardware purchase and install	\$20,000	\$0	\$0	\$0	\$0	\$20,000
Compliance Cost	\$7,000	\$0	\$0	\$0	\$0	\$7,000
Data Migration	\$15,000	\$0	\$17,500	\$0	\$20,000	\$52,500
Change Management Costs	\$10,000	\$0	\$0	\$0	\$0	\$10,000
Website Development Cost	\$20,000	\$0	\$0	\$0	\$0	\$20,000
Computer Vision Setup (Nyckel)	\$15,000	\$0	\$0	\$0	\$0	\$15,000
AWS IoT Cloud Integration	\$15,000	\$0	\$0	\$0	\$0	\$15,000
<b>Total non-recurring costs</b>	<b>\$187,000</b>	<b>\$0</b>	<b>\$26,500</b>	<b>\$0</b>	<b>\$30,000</b>	<b>\$243,500</b>
<b>Recurring costs</b>						
IoT Subscription Fees	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$60,000
ERP Subscription Fees	\$10,000	\$15,000	\$15,000	\$15,000	\$15,000	\$70,000
Employees' Salaries	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$60,000
Vendor Support	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
Continuous Training	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
AWS IoT Cloud Service Subscription	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$40,000
Nyckel Computer Vision Subscription	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$30,000
Website Maintenance	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
Deviation (10%)	\$6,300	\$6,800	\$6,800	\$6,800	\$6,800	\$33,500
<b>Total recurring costs</b>	<b>\$69,300</b>	<b>\$74,800</b>	<b>\$74,800</b>	<b>\$74,800</b>	<b>\$74,800</b>	<b>\$368,500</b>
<b>TOTAL COSTS</b>	<b>\$256,300</b>	<b>\$74,800</b>	<b>\$101,300</b>	<b>\$74,800</b>	<b>\$104,800</b>	<b>\$612,000</b>

- **Non-recurring Costs: \$243,500** (ERP setup, IoT integration, etc.)
  - **Recurring Costs: \$368,500** (Subscriptions, training, vendor support, etc.)
- Total Costs: \$612,000 (5 years)**

## TOTAL BENEFIT

Benefit/revenue analysis						
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>Revenues</b>						
Increased Revenue	\$45,000	\$49,500	\$59,400	\$89,100	\$133,650	\$376,650
<b>Total revenues</b>	<b>\$45,000</b>	<b>\$49,500</b>	<b>\$59,400</b>	<b>\$89,100</b>	<b>\$133,650</b>	<b>\$376,650</b>
<b>Cost savings</b>						
Reduction in manual errors	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
Proactive maintenance savings	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$40,000
Inventory management savings	\$5,000	\$6,000	\$7,000	\$8,000	\$9,000	\$35,000
Quality Control Cost Reduction (fre	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$35,000
<b>Total cost savings</b>	<b>\$30,000</b>	<b>\$31,000</b>	<b>\$32,000</b>	<b>\$33,000</b>	<b>\$34,000</b>	<b>\$160,000</b>
<b>Other benefits</b>						
Cloud Service Efficiency Gains	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$30,000
Customer Retention Improvement	\$8,000	\$9,000	\$10,000	\$10,000	\$10,500	\$47,500
Employee Productivity Gains	\$5,000	\$6,000	\$7,000	\$8,000	\$9,000	\$35,000
<b>Total Other benefits</b>	<b>\$19,000</b>	<b>\$21,000</b>	<b>\$23,000</b>	<b>\$24,000</b>	<b>\$25,500</b>	<b>\$112,500</b>
<b>TOTAL BENEFITS/REVENUE</b>	<b>\$94,000</b>	<b>\$101,500</b>	<b>\$114,400</b>	<b>\$146,100</b>	<b>\$193,150</b>	<b>\$649,150</b>
Total non-recurring costs	-\$187,000	\$0	-\$26,500	\$0	-\$30,000	-\$243,500
Total recurring costs	-\$69,300	-\$74,800	-\$74,800	-\$74,800	-\$74,800	-\$368,500
<b>TOTAL COSTS</b>	<b>-\$256,300</b>	<b>-\$74,800</b>	<b>-\$101,300</b>	<b>-\$74,800</b>	<b>-\$104,800</b>	<b>-\$612,000</b>

- **Revenue Increase: \$376,650**
  - **Cost Savings: \$160,000** (reduced errors, quality control, etc.)
  - **Other Benefits: \$112,500** (customer retention, productivity gains)
- Total Benefits: \$649,150 (5 years)**



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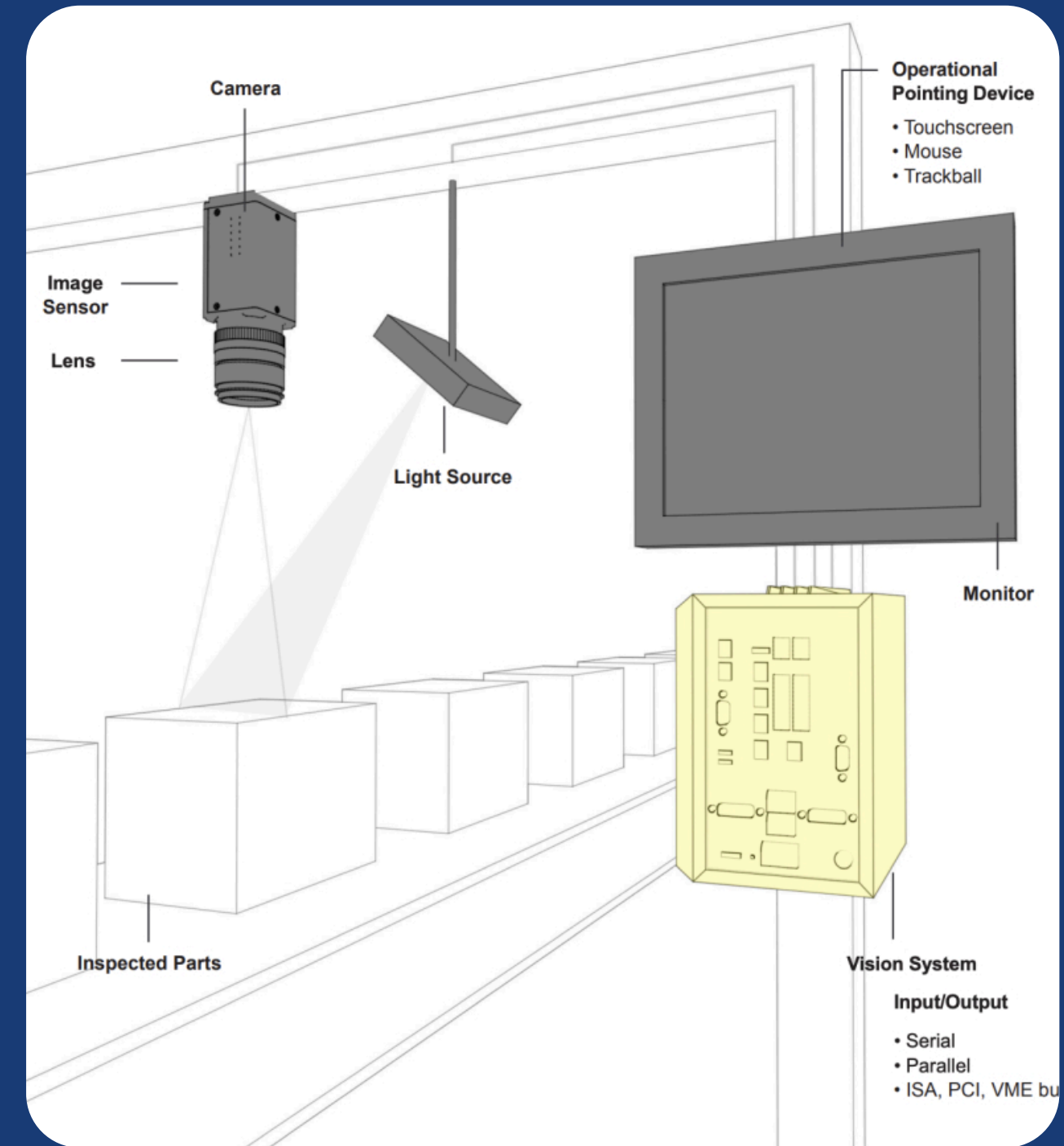


# ARCHITECTURE DESIGN



## HARDWARE PREPARATION

Components	Costs
Liquid lenses (ITALA G.EL)      Lighting system	~ \$1,000 – \$1,500 per unit
Bosch BME280 (temperature and humidity sensors)	~ \$20 – \$30 per unit
Siemens Simatic RF600 RFID readers	~ \$1,100–\$1,400 per unit
Advantech WISE-6610 IoT gateways      LoRaWAN	~ \$750–\$1,000 per unit





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# ARCHITECTURE DESIGN



## SOFTWARE PREPARATION

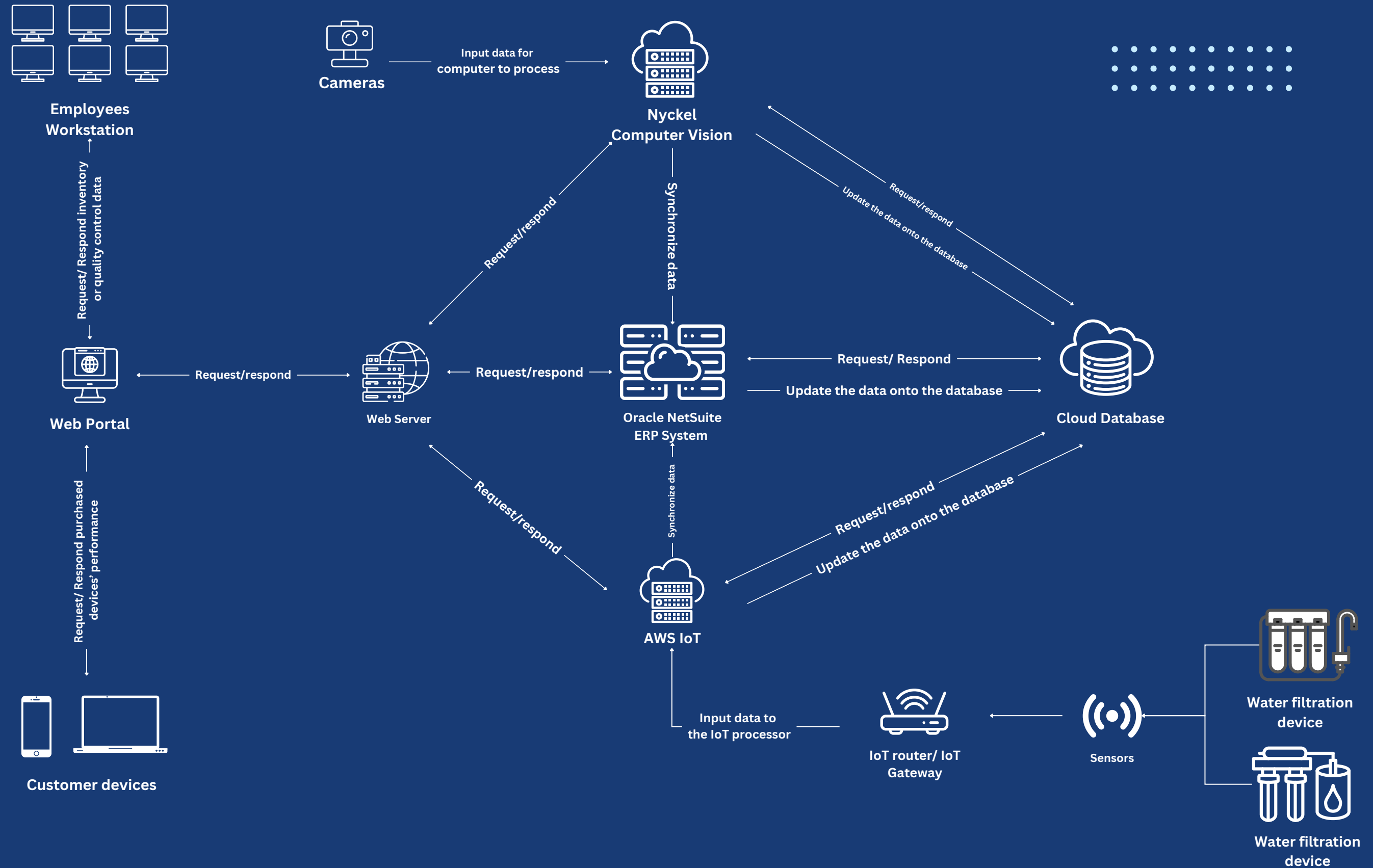
Components	Costs
Cloud ERP – Oracle Netsuite	~ \$1,000–\$3,000 per month
Computer Vision – Nyckel AI	~ \$500–\$1,000 per month
IoT Data Management – AWS IoT	Pay-per-user model: \$0.08 per million minutes of connection and \$1 per million messages



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# SYSTEM ARCHITECTURE





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## CONTROL ALL PURCHASED DEVICES

- Metrics about Water Purity, status of the products... are provided
- Allowing adding devices as customer purchase more devices
- Data is updated continuously from the IoT

## PROVIDE IN-APP POST-SALE SUPPORT

- Different communication channels are provided
- Frequently asking questions with answers
- Maintain the system in a more proactive approach

## COMPREHENSIVE PERFORMANCE HISTORY

- Any abnormalities will be informed through in-app and email notification
- Highlight specific issues and recommend solutions to resolve



# USER INTERFACE

# IMPLEMENTATION PLAN

<u>Existing</u>	<u>New</u>
<b>Legacy System</b>	
Data store locally	Migrate to cloud database
Relies heavily on computing power	Data analyzed through cloud platform
<b>Inventory Management</b>	
Manual stock tracking	IoT automate the process
Manual update stock	Stock data updated in real time
<b>Quality Control</b>	
Manual product inspect	Computer vision automated detect

The QC team manually communicate with warehouse	The QC team manually communicate with warehouse
<b>Customer Post-Sale Support</b>	
Customer track device performance manually	Website provided for frequent monitoring
Customer only seek help when meet major damage	Online frequent support in the early stages
<b>Workforce Management</b>	
Employee skill gaps	Platform training content provided
Lack of IT related position	More IT related position introduced

*Figure: Comparing table of the Existing System and the New Implementation*



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# DOCUMENTATION & OPERATION MANUAL

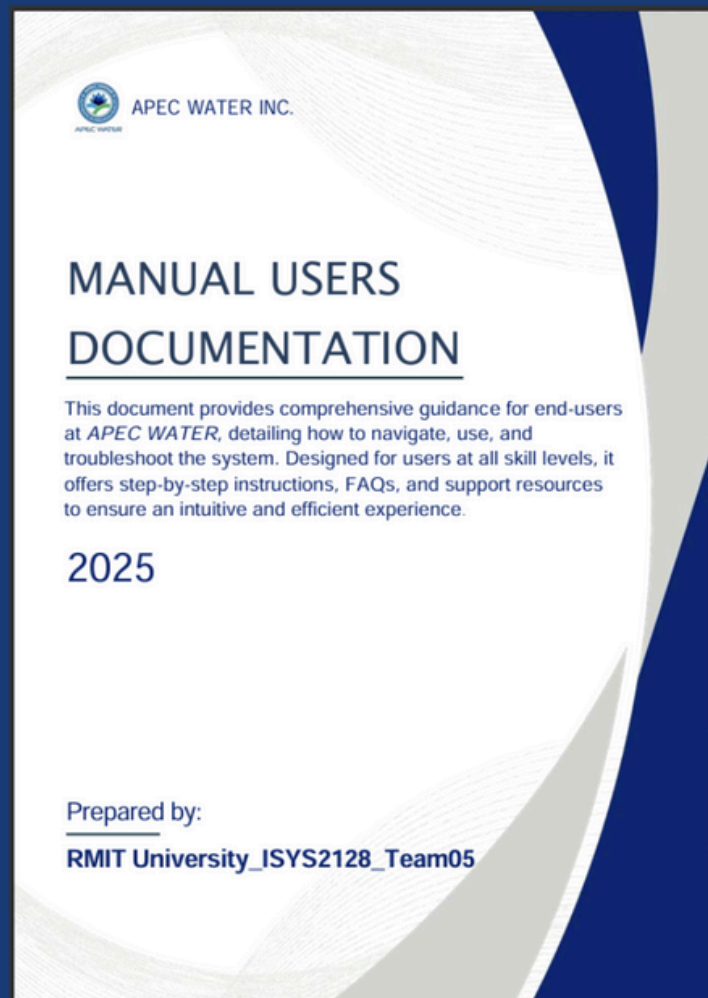


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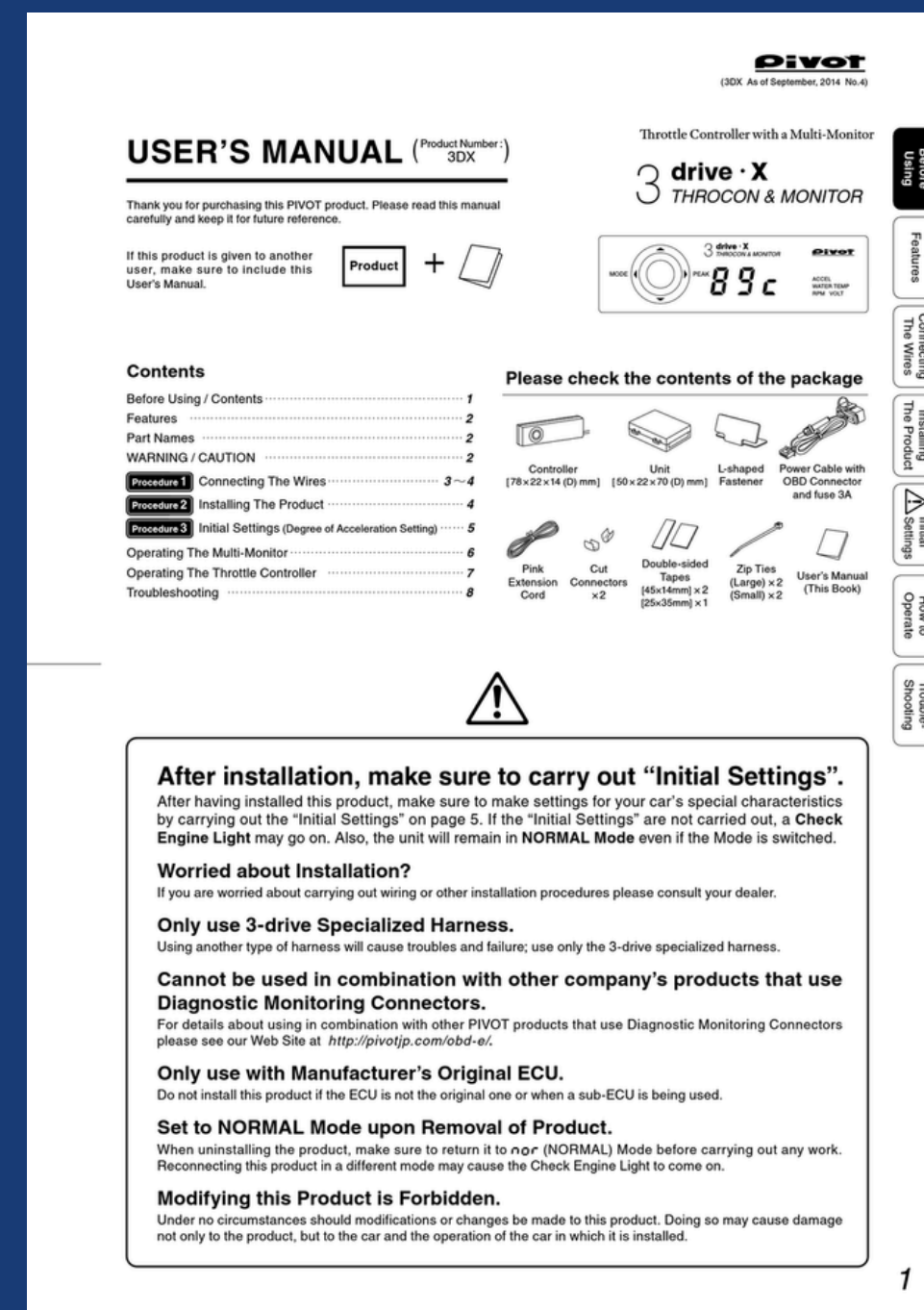


Figure: Detailed Documentation written for Manual Users, Program, System and Operations

Figure: Poster displays within the Manual Users Documentation



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# CHANGE MANAGEMENT



## JIRA

JIRA, an out-of-the-box tool, to manage the change tasks

## SCRUM

Scrum is perfect for our project because it helps manage sprints, backlogs, and issues.

## HOW IT WORKS

JIRA offers various templates, but we can also design custom workflows based on the needs of the project.

## TASK CREATION, MANAGEMENT, AND MANAGING THE BACKLOG:

- Within Scrum, we'll create tasks, issues, and epics during sprint planning.
- One of the most critical aspects of managing tasks is maintaining the backlog



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# INTERNAL & INFRASTRUCTURE CHANGES

## INTERNAL CHANGES

- Customer Service & Sales
- IT Engineers
- Finance
- Managers

## TRAINING OVERVIEW

- Pre-implementation: Employees like IT engineers will receive advanced training
- Post-implementation: Staff will continue learning, focusing on system operation, troubleshooting, and vendor negotiations.

## INFRASTRUCTURE CHANGES

- The system will require hardware and software upgrades
- We'll also need a new internet connection and possibly other infrastructure improvements
- As the project progresses, additional engineers and technicians may require more office space

## EXTERNAL CHANGES

- Customer Impact
- Compliance

# CONCLUSION

- Enhance operational efficiency, quality control, and overall customer experience.
- These innovations will streamline processes, improve communication, and provide real-time insights.
- The introduction of customer-facing apps for order tracking and system monitoring.



# THANK YOU

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