SIMATS ENGINEERING

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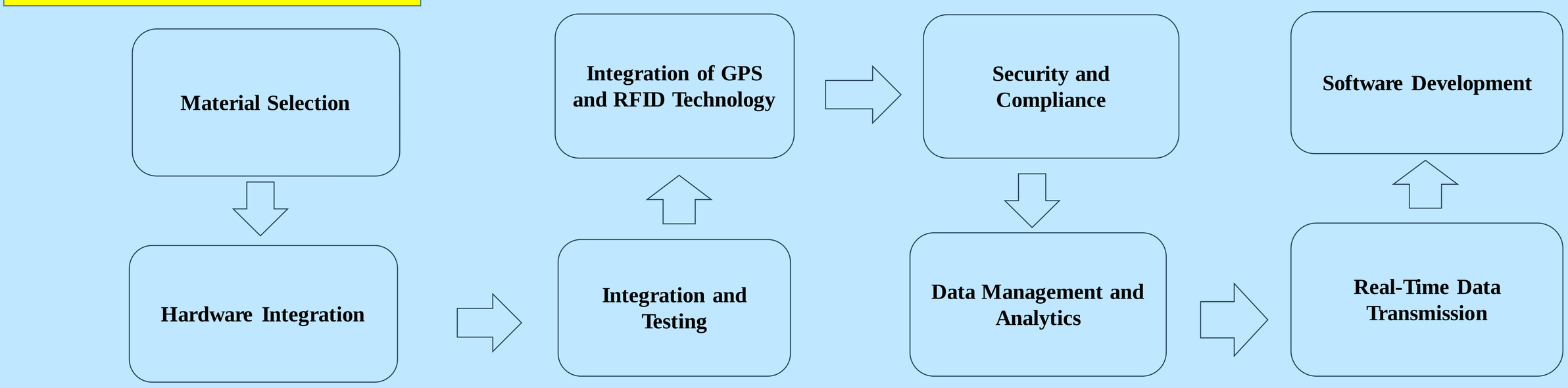
Enhancing the shipment tracking system that utilizes mobile connectivity of Global positioning system(GPS) comparison with RFID

INTRODUCTION

- The aim of the project is to Enhancing the shipment tracking system that utilizes mobile connectivity of Global positioning system(GPS) comparison with RFID.
- Enable real-time monitoring of shipment locations, allowing for prompt interventions in case of delays or disruptions and Enable better management of inventory, transportation, and distribution processes.
- Utilizing GPS data allows for real-time route optimization based on traffic conditions, weather forecasts, and other variables. This optimization not only ensures timely deliveries but also reduces fuel consumption and transportation costs.
- Integrate data from GPS and RFID systems to provide comprehensive tracking information, including location, timestamp, and status updates . Records of past shipments, including origin, destination, transit times, and any incidents or delays encountered.
- Through this exploration, valuable insights can be gained to inform decision-making processes for organizations seeking to enhance their shipment tracking capabilities.

Shipment tracking system

MATERIALS AND METHODS



RESULTS

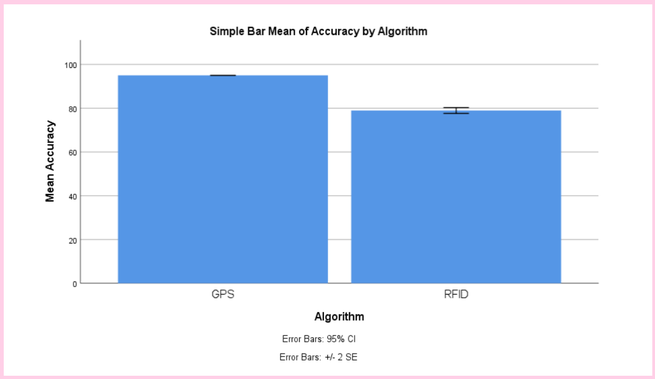


Figure1:The bar graph illustrates distinctive variations in mean accuracy between the Global Positioning System (GPS) and RFID algorithms. The GPS algorithm displays a noteworthy mean accuracy of 95.00, outperforming the RFID algorithm with a mean accuracy of 78.95.

	Algorithm	N	Mean	std. Deviation	Std. Error Mean
Accuracy	GPS	20	95.00	0.026	0.006
	RFID	20	78.95	2.982	0.667

Table1:Global Positioning System (GPS) and RFID. Both algorithms were applied to 20 samples each. The mean value achieved by the Global Positioning System (GPS) was 95.00, surpassing the mean of 78.95% obtained by the RFID algorithm

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig	T	Diff	sig(2-tailed)	Mean Difference	std.Error difference	95% Confidence Interval of the Difference	
								lower	upper
Equal variances assumed	63.627	0.000	24.063	38	0.000	16.046	0.667	14.696	17.395
Equal variances not assumed	-	-	24.063	19.003	0.000	16.046	0.667	14.650	17.441

Table2:The standard deviations for the Global Positioning System (GPS) and RFID were 0.26 and 2.982 respectively. Moreover, the standard error means were 0.006 for the Global Positioning System (GPS) and 0.667 for RFID

DISCUSSION AND CONCLUSION

- The mean accuracy achieved by the GPS algorithm is significantly higher (95.47) compared to the RFID algorithm (78.95), indicating that GPS technology provides more precise location data for tracking shipments.
- Moreover, the standard deviation for the GPS algorithm (0.26) is notably lower than that of the RFID algorithm (4.356). This indicates that the GPS algorithm provides more consistent and reliable results across different samples, making it a more dependable choice for real-time tracking applications.
- The statistical analysis further confirms the superiority of the GPS algorithm over RFID, with the independent sample t-test revealing a statistically significant difference between the two algorithms at a 95% confidence interval ($p < 0.05$).
- The superiority of GPS technology over RFID in the context of shipment management tracking systems is evident. With its unparalleled accuracy, seamless integration, dynamic adaptability, and global coverage, GPS emerges as the preferred choice for enabling efficient and reliable shipment tracking operations

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