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Exercise 4: Cost and Time Estimation

Task: Provide an estimation of cost and time to implement the described software.

1. Estimating Function Points (FP):

| FUNCTION | ACTION | CATEGORY | POINTS |
|---|-----------|-----------------------|---------------|
| SELECT BOX to select a Sensor | SELECT | External Input | 4 |
| ADD Button to add Sensor | ADD | External Input | 4 |
| Several sensors can be added | AGGREGATE | Internal Logical File | 7 |
| If Sensor exists in list, ADD operation is ignored | VALIDATE | Internal Logical File | 7 |
| Sensor in list can be marked | MARK | External Inquiry | 3 |
| REMOVE button pushed (removes marked Sensor) | REMOVE | External Input | 3 |
| START button pushed <u>App collects Sensor data.</u> (changes label to STOP) | COLLECT | EI / EO | 9 |
| ADD or REMOVE Sensors not possible when collecting data | LOCK | Internal Logical File | 7 |
| After pushing STOP data is sent to backend service | TRANSFER | External Output | 4 |
| | | | FP: 48 |

2. Calculate Lines of Code (LOC) and Kilo Delivered Lines (KDL)

- Using Java: LOC per FP = 53
 - $LOC = 48 * 53 = 2544$
- $KDL = 2756 / 1000 = 2.54$

3. Effort Estimation with COCOMO (COConstructive-COST-MODEL)

- Effort: $a * KDL^b = 2.8 * 2.54^{1.20} = 8.56$ Person-Months
- Effort Adjustment Factor: $8.56 * 1.40 * 1.08 * 0.86 = 11$. Person-Months (~ 337 workdays)

4. Duration based on Workforce (3 developers):

- Duration = 337 workdays / 3 = 112.33 workdays (~ 16.04 weeks, 3.69 months)

5. Calculate Cost: Based on Swiss developer Avg. salary (<https://ch.talent.com/en/salary?job=software+developer>)

- Average salary: \$ 430.8 CHF/day (8 hr)
- Cost = 112.33 workdays * 430.8 CHF/day = \$ 48,392 CHF

6. Conclusion:

- Estimated implementation duration (3 Developers): 16.04 weeks or 3.69 months.
- Projected total cost CHF 48,392.