



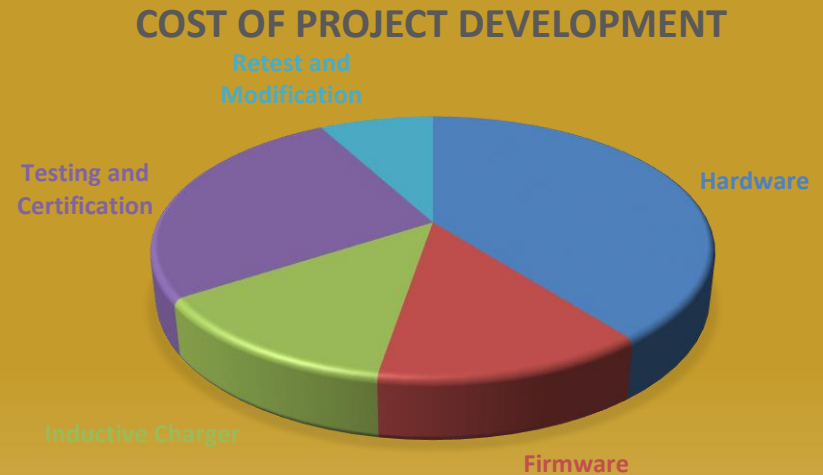
IOT Seminar

**CASE STUDY – PLAN FOR THE
COMPLIANCE TO
REGULATIONS DURING
DESIGN PHASE TO SAVE
PROJECT COST AND TIME**



Introduction

- IOT product development is an investment process, which requires time and cost.
- Let see how much difference when planned or not planned.



Scenario – IoT Smart Home Unit

- Planned development cost: HK\$680,000
- Hardware/ firmware development
 - HK\$150,000
- Software apps development
 - HK\$20,000
- Server establishment
 - HK\$10,000
- Testing and certification
 - HK\$150,000
- Reliability and Environmental Considerations
 - HK\$200,000
- Industrial Design
 - HK\$150,000

Example

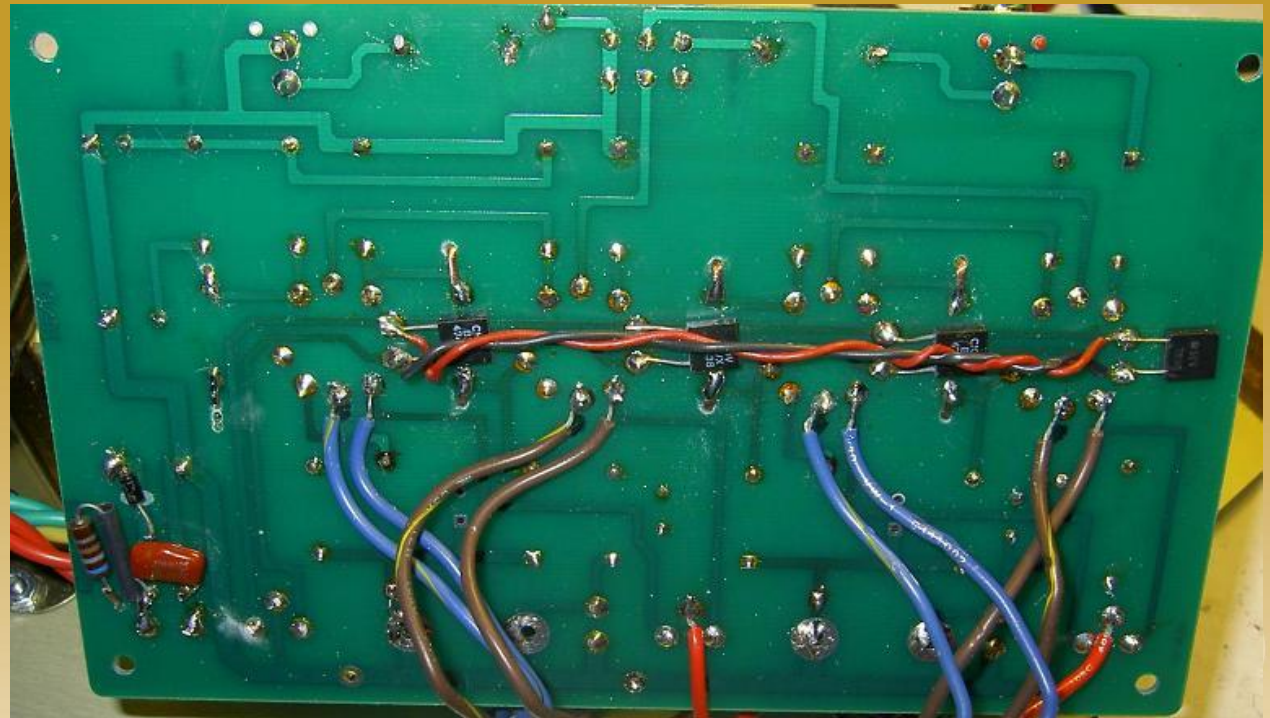
Project Cost: HK\$680,000

**“EVERYTHING THAT CAN GO WRONG
WILL GO WRONG”**

Murthy's Law

Once Failed in Certification Test

- Modification is needed



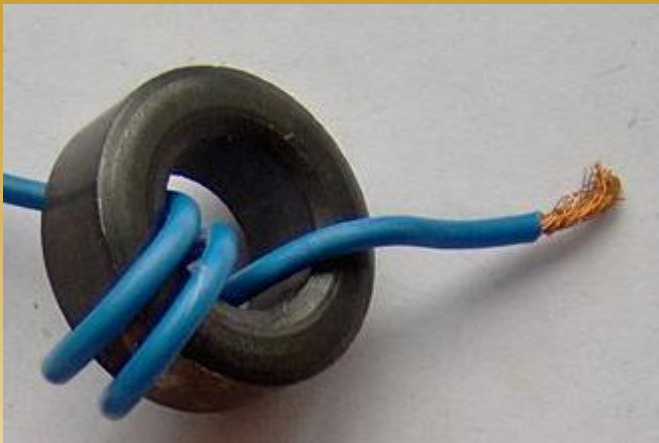
Failed in Certification Test

- PCBA fixed, cannot modify



Failed in Certification Test

- Need to add expensive components (shielded cables/ ferrite cores) to meet the compliance requirement



Failed in Certification Test

- Modification may be hard to productize (sticking metal foil inside the case)



Failed in Certification Test

- One slight modification for a single test may prone to retest for a number of test items in the test suit

Project End Costing

- Planned development cost: HK\$680,000
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 - HK\$10,000
- Testing and certification
 - HK\$150,000
- Reliability and Environmental Considerations
 - HK\$200,000
- Industrial Design
 - HK\$150,000
- Additional
 - Hardware modification
 - HK\$15,000
 - Retest
 - HK\$90,000
 - Industrial Design Update
 - HK\$15,000

HK\$680,000 to
HK\$797,000!

Project Time

- Retest: 1 extra month
- Modification: 2 weeks
- Design update: 2 weeks

2 extra months!

Planning is Important!

- Attend seminars offered by laboratories to know the latest testing and certification requirements
- Understand test modes and plan ahead before testing phase
- Introduce test plan and pretest during prototyping stage (3 stages of prototyping, check for each stage)

How to avoid this unexpected cost

- Pre-test during design and development phase
 - Define potential issues before actual test
 - At the time when PCB/ molding could still be modified
 - If one test fails, focus on that test, no retests on all items
 - Controllable corrective action and cost and production

What Pre-test service would you need for your IoT product?

- EMC pre-scan and rework at design stage
- EMC/RF
 - Spurious Emission
 - Bandwidth Checking
 - RF Power
- Automotive Related IoT (e.g. infotainment system/ non safety related)
 - EN50498 (e-mark replacement -12VDC)
 - ISO 7637
 - CISPR 25
- Power Supply Related
 - Conducted Emission
- LED Light
 - Radiated Emission
 - Conducted

Proper project schedule during prototype development

- Design Phase
 - First Prototype: Preliminary check/ Design check (test modes/ RF settings/ spurious emission)
 - Second Prototype: Major changes with modification
 - Third Prototype: Minor updates, submit for certification process (commercial lab)

Typical Pre-Certification Test Facility



10m Semi Anechoic Chamber

achieves

**RF Power/ Spurious
Emission**

What Pre-test service would you need for your IoT product? (2)

- Sensor durability
- Mechanical strength
- Sound quality

Facility which could support your development

- Tension test
- X-Ray
- Banding test
- Audio spectrum
- Vibration system
- Thermal imaging



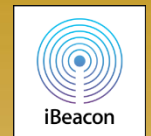
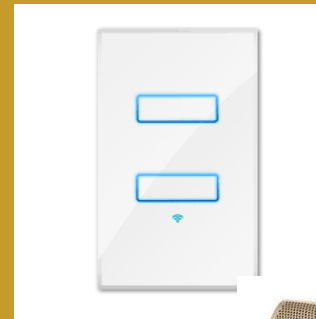
PCB Testing and Quality Check



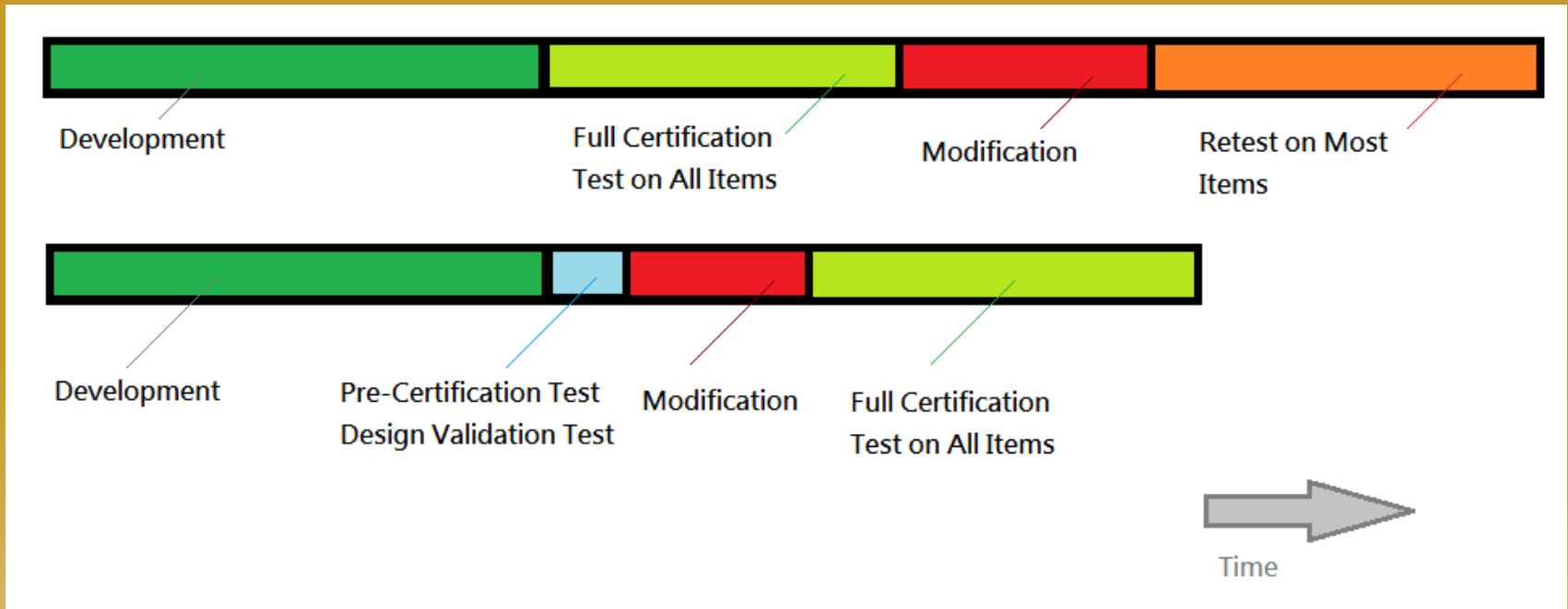
Product Reliability Testing

For whom who are new into IoT products

- Battery/ Power Consumption considerations
- Communication Range
- RF Sensitivity

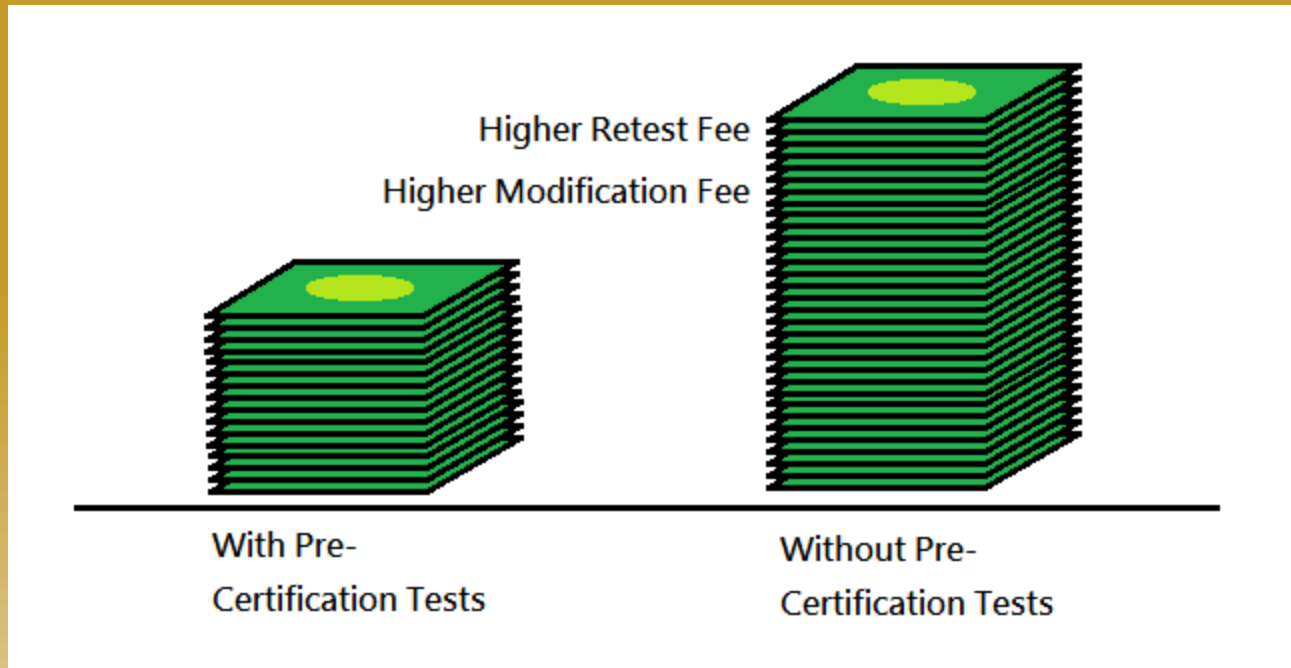


How Much Can We Save?

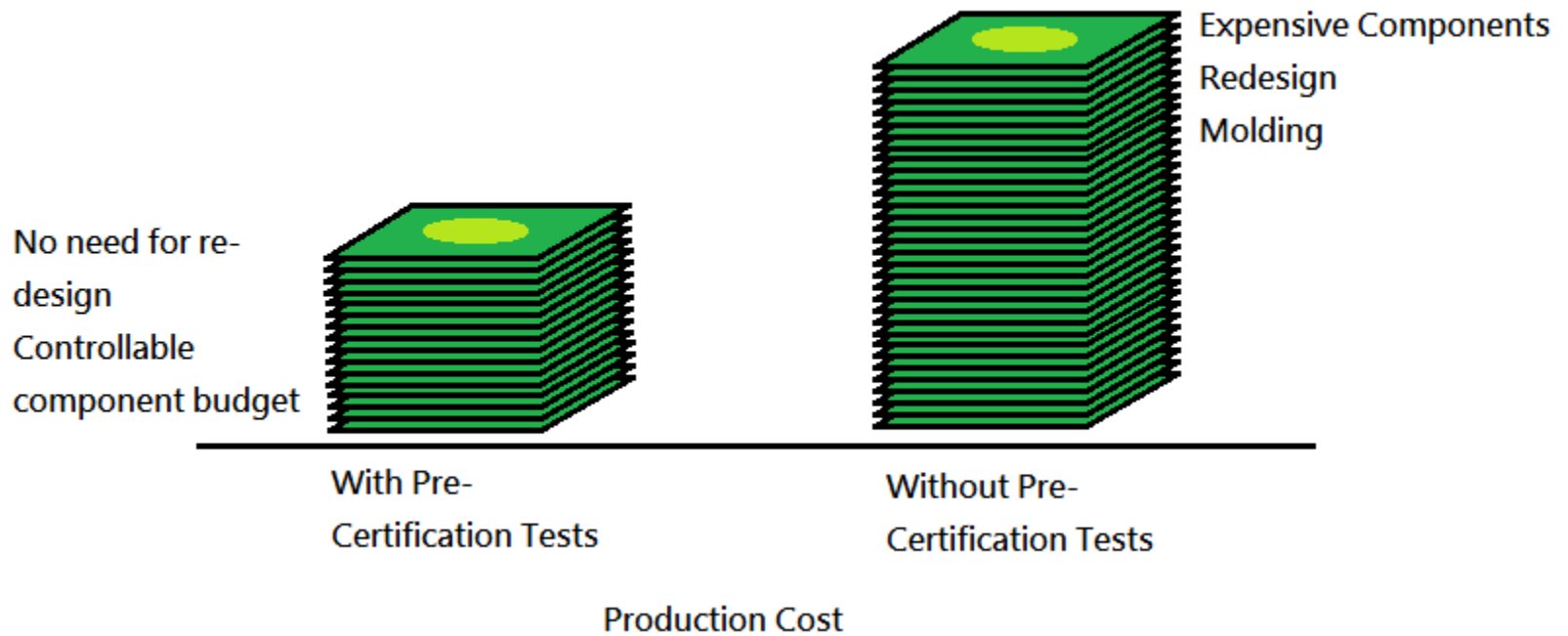


- Shorter Modification Time
- Selected Pre-Certification Items

Development Cost



Production Cost



Project End Costing

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- Reliability and Environmental Considerations
 - HK\$200,000
- Industrial Design
 - HK\$150,000
- Additional
- Pretest
 - \$20,000
- Testing Consultancy
 - HK\$30,000

HK\$797,000 to
HK\$730,000!

More Saving?

- Cash Rebate Scheme for your research and development budget



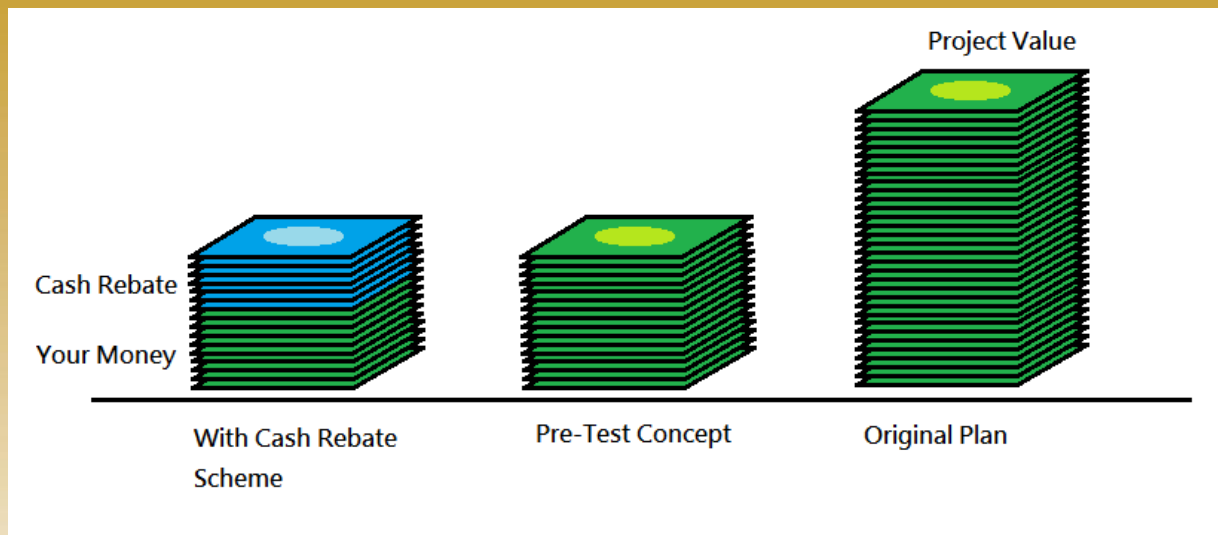
Cash Rebate Scheme

- Offered by Hong Kong Government
- 40% Cash Rebate
- Rebate in 2 sections
- Obtaining consultancy service, pretest service and support in development at the same time
- Someone help you to develop the whole project with project experience
- Total solution with lowered project cost

Project Costing with Rebate

- 40% government refund
- HK\$730,000! X 60% = HK\$438,000

40% Project Cost Deduction!



Option – Development with R&D Centres

- Technical Consultancy
- Development Support
- Manufacturing Support
- Testing and Certification Support
- Funding Support

Less Manpower, Less Time, Less Cost!

如有任何查詢，歡迎聯絡我們

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THANKS!

