

# IoT Decision Workbook

Public Version  
Group 1

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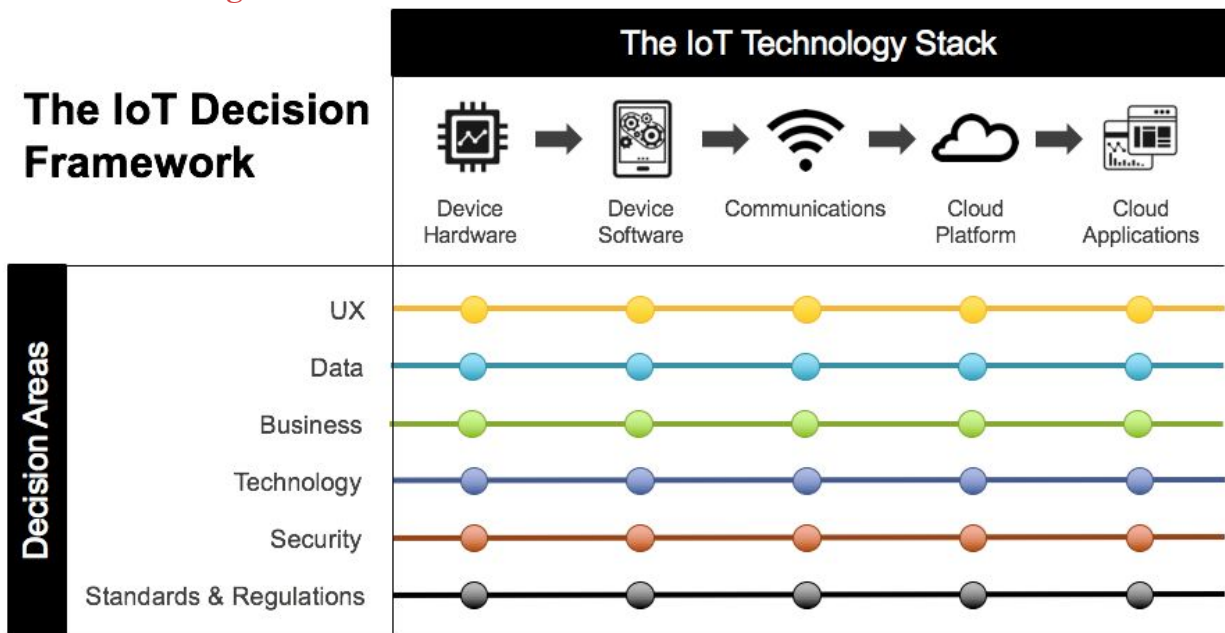
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# 1. Introduction

The IoT Decision Workbook is a companion to the IoT Decision Framework. It provides you with the key questions every Product Manager should answer to take control of your IoT product strategy.

## Start with the IoT Decision Framework

If you haven't already, I recommend you start by reading my article, [The IoT Decision Framework for Product Managers](#).



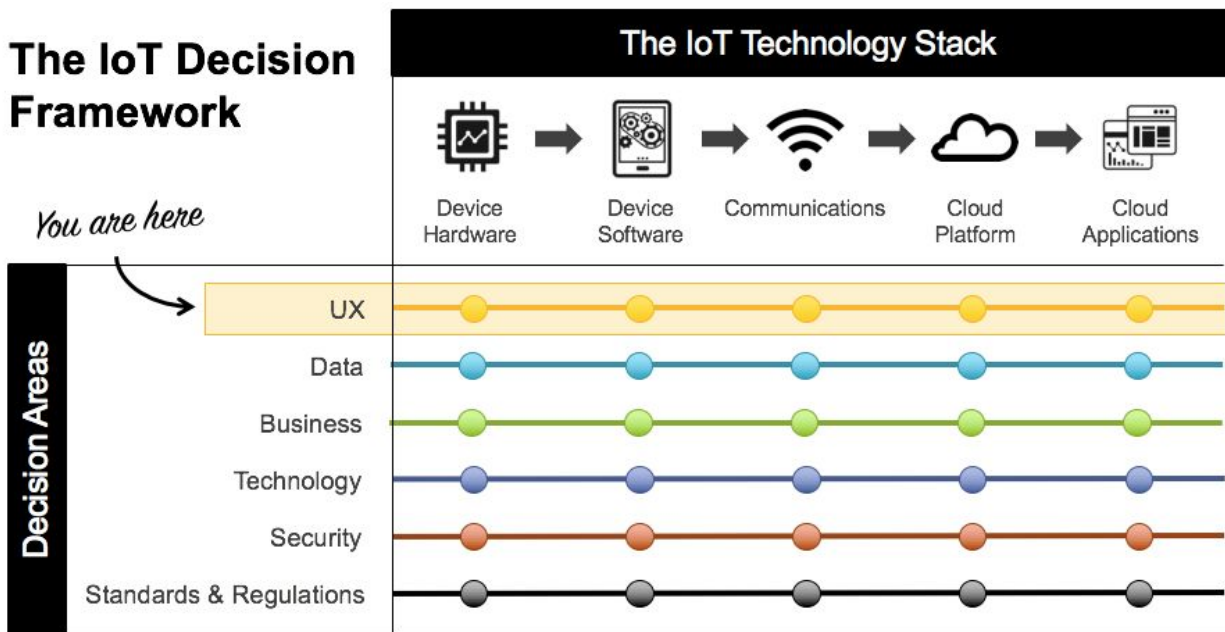
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## 2. Product Positioning

1. Following is a concise summary of the product positioning.  
(Later on in the process)

<b>B2B: Target Company Type</b> <b>B2C: Target Audience:</b>	<b>B2B</b>
<b>Decision Maker:</b>	<b>What do retirement houses need</b>
<b>Problem Statement:</b> <b>What problem are we looking to solve?</b>	<b>Dementia patients tend to run away and get lost. We need an easy way to locate them and bring them back.</b>
<b>Value Proposition:</b> <b>How will our product solve their problem?</b>	<b>By giving the nurses the tools to easily locate runaway patients.</b>
<b>Your Company Size:</b>	<b>five employees</b>

## 3. User Experience (UX) Decision Area



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- Based on the background info above, identify which users will be involved at each stage of the Product Lifecycle.

	Sales	Install	Provision	Onboard	Operate	Maintain	Decommission
Customer (external users)	• Director	• Nurse	•	• Nurse • Security • Facility Manager	• Nurse • Security • Facility Manager	• Facility Manager	• Facility Manager
Your company's employees (internal users)	• Sales rep	•	• Engineers • Data Manager • Network Manager • Hardware Manager	• Trainer • Advisor	• Engineers • Data Manager • Network Manager • Hardware Manager	•	• Engineers • Data manager • Network Manager • Hardware Manager
Partners/ Vendors (external users)	•	• Technician	• Technician	•	•	• Technician	• Technician

2. Define the user personas identified in the previous step.



**Maria Janssens, 94**  
**Elderly Woman**  
**13 years of dementia**

**“I enjoy taking long walks, but I am worried that I get robbed on my trip. My memory also leaves me sometimes and I want people to find me when I don’t return in time.”**

**Maria’s Goals:**

- Getting an alert when I’m wandering off
- Going out without the risk of getting lost
- A device I wouldn’t throw out



**Jef Staes, 48**  
**Retirement house - Nurse**  
**24 years of service**

**“Sometimes an elderly person goes on a walk without a reason.”**

**Jef’s Goals:**

- Tracing elderly people when they walk out the door
- Finding them
- Being able to optimize the retirement house using the data that has been acquired
- Getting visual information of alert status, temperature and floor levels of patient

### 3. Identify activities for each user across the Customer Lifecycle.

Only include activities in which the persona is interacting with our product.

	Sales	Install	Provision	Onboard	Operate	Maintain	Decommission
Maria Janssens – Elderly woman (customer)	•	•	•	•	<ul style="list-style-type: none"> <li>• Comfortable</li> <li>• Easy to use</li> </ul>	<ul style="list-style-type: none"> <li>• Durable</li> </ul>	•
Jef Staes – Nurse (customer)	<ul style="list-style-type: none"> <li>• See what's possible</li> <li>• Demo</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the system</li> </ul>	•	•	<ul style="list-style-type: none"> <li>• Easy to navigate</li> <li>• Get alerts</li> </ul>	<ul style="list-style-type: none"> <li>• Long battery</li> <li>• Durable</li> </ul>	•

### 4. Prioritize our users / activities and divide them between MVP and backlog.

#### MVP (order of priority):

Priority (#)	User	Activity
1.	Jef - Nurse	Receive alerts and tracking data
2.	Maria - Elderly Woman	Getting an alert when wandering off
3.		
4.		
5.		
6.		

#### Backlog (order of priority):

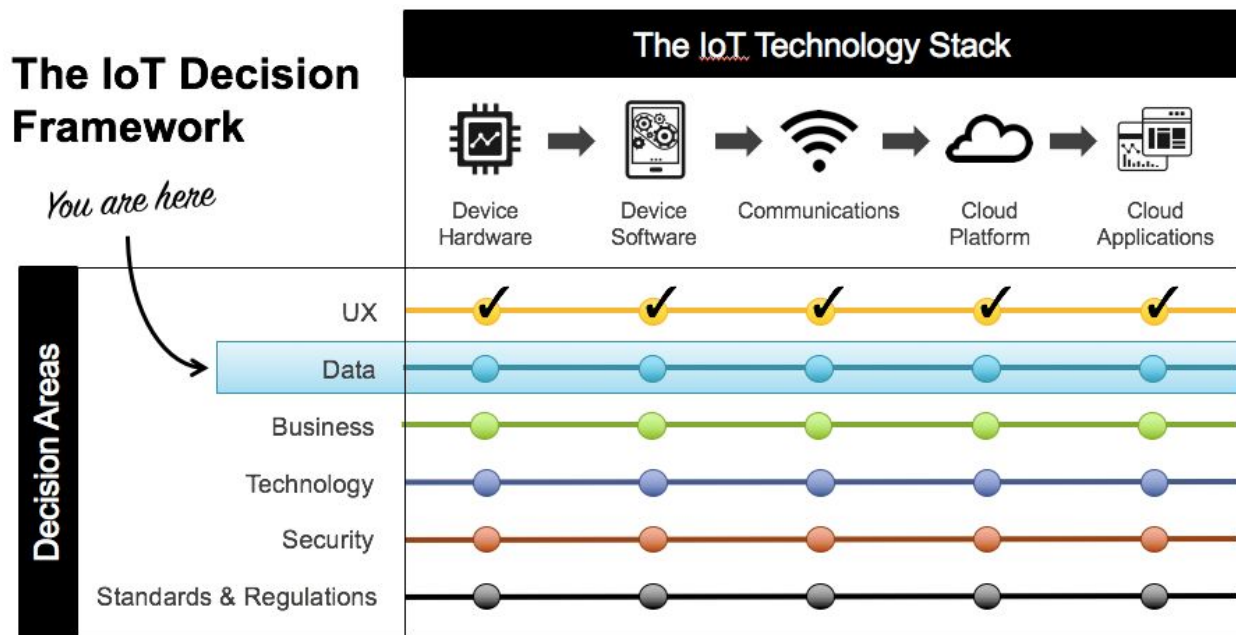
Priority (#)	User	Activity
1.	Jef - Nurse	Easy to use, install and maintain
2.	Maria - Elderly Woman	Easy to wear and use

5. Walk the IoT Technology Stack for each of the MVP users and activities above.

As you walk the stack, the question you are looking to answer is: “What will make for a great experience at each layer of the stack?” (Think about what they want, not how you will solve. May not be applicable to all layers.)

Device Hardware	<ul style="list-style-type: none"> <li>● Lightweight</li> <li>● Accurate sensors</li> <li>● Durable</li> <li>● Long battery life</li> <li>● Elements resistant</li> </ul>
Device Software	<ul style="list-style-type: none"> <li>● Real-time tracing and alerts</li> <li>● Robust OTA updates</li> <li>● Energy efficient</li> <li>● Alarm system</li> </ul>
Communications	<ul style="list-style-type: none"> <li>● Works everywhere - wide range</li> <li>● Robust communication mechanisms</li> <li>● Low power communication mechanisms</li> </ul>
Cloud Platform	<ul style="list-style-type: none"> <li>● High reliability</li> <li>● Aggregate data from all users (elderly people)</li> <li>● Analyse movements of runaways. Use data to prevent other situations</li> </ul>
Cloud Applications (include form factor(s) chosen)	<ul style="list-style-type: none"> <li>● Easy to navigate</li> <li>● Alerts sms, email, notification, ...</li> <li>● Give insight in when and where people run away. Suggest modifications</li> </ul>

## 4. Data Decision Area



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### Data Strategy

1. What is our data strategy? (i.e. What do you plan to do with all the data?) Include how you'll add value to a single customer vs. how you'll leverage data aggregation across all your customers.

We use the anonymised data of all customers to develop algorithms to make structural changes to the retirement house. This will make it harder for people to run away.

### Device Hardware

2. What type of data will we need our device to produce? (e.g. location, temperature, position, etc.)

Position and path of movement (inside and outside till a certain range), temperature, altitude

3. How much data will one customer produce per year?

Depends on the protocol we use (later on).



## Device Software

4. Do we need to perform local analytics /edge computing? What kind?

Alarm when leaving the safe area.

5. Do we need other sources of data to perform our local analytics? What kind?

Safe area

## Communications

6. Which data do we need to transmit to the cloud, and how often?

Possible: Location and movement - when changes in movement. Now implemented: every 4 seconds

7. What kind of local devices do we need to exchange data with, and what kind of data? (if applicable)

Dash7 gateway - movement data + sensor data  
LoRaWAN gateway - GPS

## Cloud Platform

8. What type of analytics do we need to perform?

Algorithms to make structural changes to the retirement house.

9. Do we need to operate on real-time or batch data?

Batch data

10. Outside of the data our device produces, what other data sources do we need to incorporate at the cloud layer?

Time/date, maps (Google maps and building maps) and weather data

## Cloud Applications

11. What data needs to be displayed to the MVP users?

Map with blue dot (Google maps and blueprint of building), alert status, temperature, direct floor level

12. Does the user need data in real-time, historical, or both?

Both, depending on the situation

## Data Policies

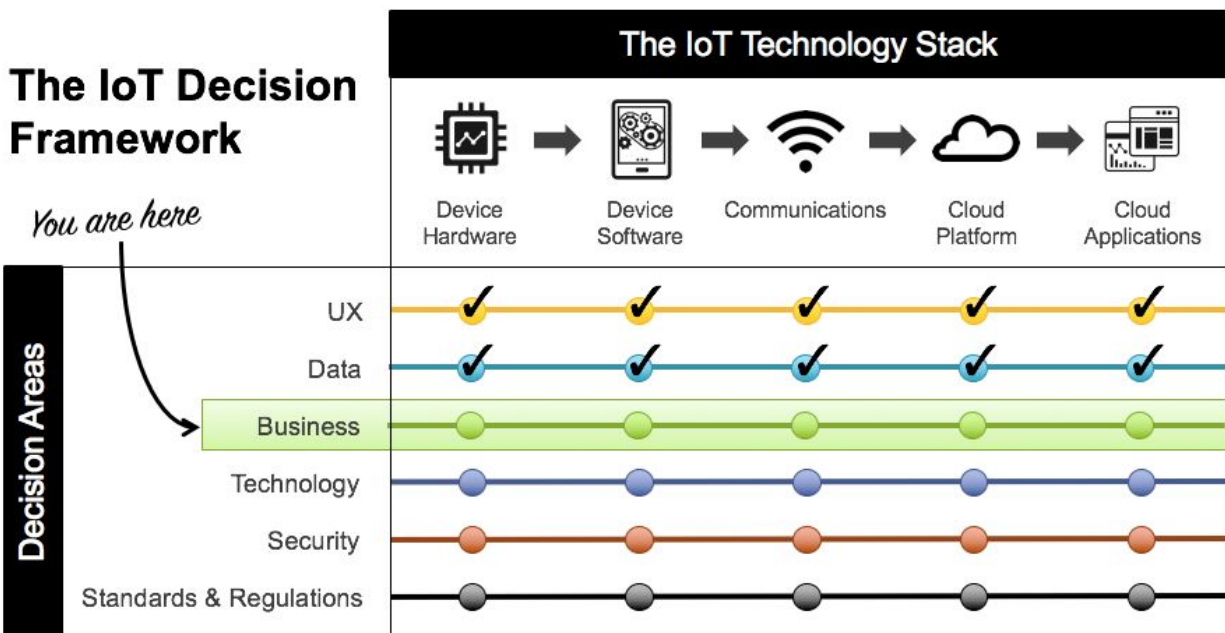
13. Retention: How long will we keep our customer's data and why?

1 year, because of seasons. Changes in environment.

14. External Sharing: Which customer data will we share with third parties, and will it be anonymous?

No

## 5. Business Decision Area



1. **Solution Level:** How much revenue will the product generate per customer per year? Include both one-time and recurring charges. Use the companion “Revenue and Cost model” spreadsheet to help you with the calculations.

<b>Recurring revenue per customer year:</b> <ul style="list-style-type: none"> <li>• Fill out and paste the Recurring Revenue section from the Revenue and Cost model spreadsheet.</li> <li>• Add any additional information to justify your calculations.</li> <li>• Explain whether your pricing is flat, usage based, or outcome based.</li> </ul>	N/A
<b>One-time revenue per customer:</b> <ul style="list-style-type: none"> <li>• Fill out and paste the One-Time Revenue section from the</li> </ul>	N/A

Revenue and Cost model spreadsheet. • Add any additional information to justify your calculations.	
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2. Will we build, buy, or partner at each layer of the IoT Stack? Why? (I recommend only building the layer(s) your company adds value in. Don't reinvent the wheel.)

Layer	Decision	Justification
Device Hardware:	• Buy, build	• Freedom to change design
Device Software:	• Build	• Area of expertise
Communications:	• Buy	• Good alternatives
Cloud Platform:	• Buy	• Good alternatives
Cloud Applications:	• Build	• Freedom to make changes

3. What is the variable cost to our company per customer per year?

Note: At this stage, you won't have selected the exact technology you'll use yet. So there's no way you can know the exact costs of each of these items at this point. For now, your goal is to use estimated costs to test your business model. These estimates will also serve as guidelines to develop cost targets for your technology components. After completing the technology section, I encourage you to revisit this section and refine your costs.

Recurring costs per customer year: • Fill out and paste the Recurring Cost section from the Revenue and Cost model spreadsheet. • Add any additional information to justify your calculations.	N/A
One-time costs per customer: • Fill out and paste the One-Time Cost section from the Revenue and Cost model spreadsheet.	N/A

● Add any additional information to justify your calculations.

4. What is our annual revenue, cost, and gross margin per customer by year, for the duration of the contract?

Paste from your Revenue and Cost Model spreadsheet and add any explanation or commentary

N/A

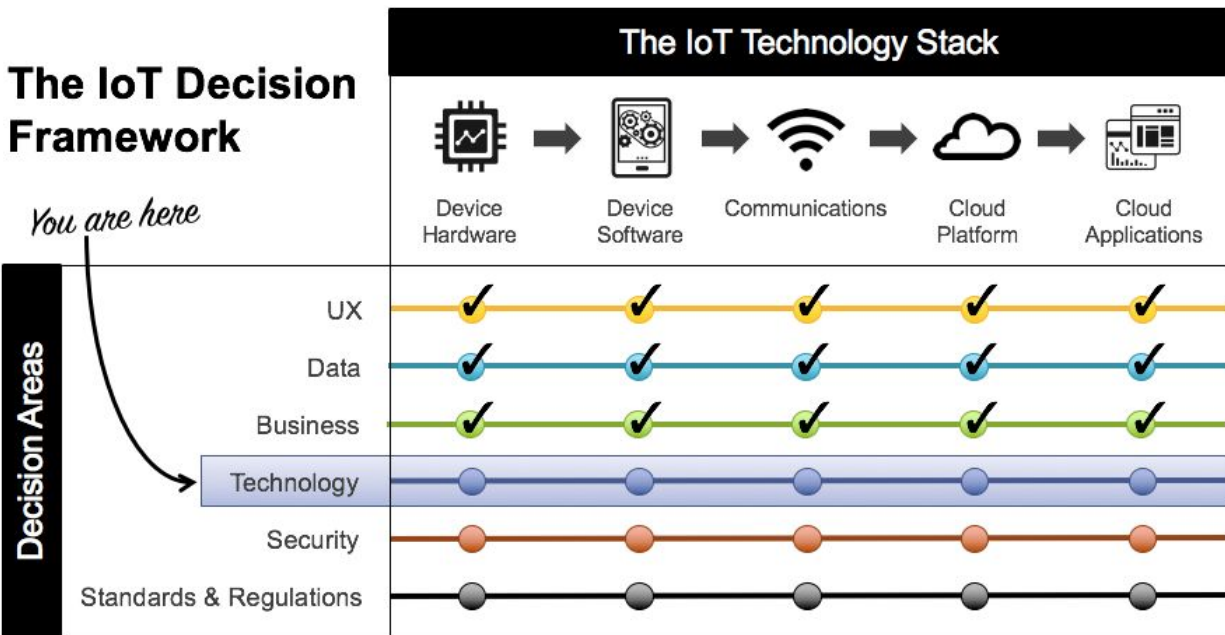
5. Will we open an API? At which layers? Why or why not? (Supporting Article: **The Business of APIs: What Product Managers Need to Plan For**)

Layer	Decision	Justification
Device Software:	• No	•
Cloud Platform:	• We buy a platform	•

6. If we are opening an API, which departments will be affected and what do they need to plan for? (See supporting article in question above.)

If we open an API our hardware department will be in competition with other companies.

## 6. Technology Decision Area



### Device Hardware

1. **Data Acquisition Module:** What sensor(s) do we need in our device(s)?

Accelerometer, communication sensor (DASH7/LoRa), temperature sensor, GPS, barometer

2. **Data Processing Module:** Do we need a system on a chip (SoC), embedded computer, or industrial computer? Why?

SoC, it has to be wearable and low power

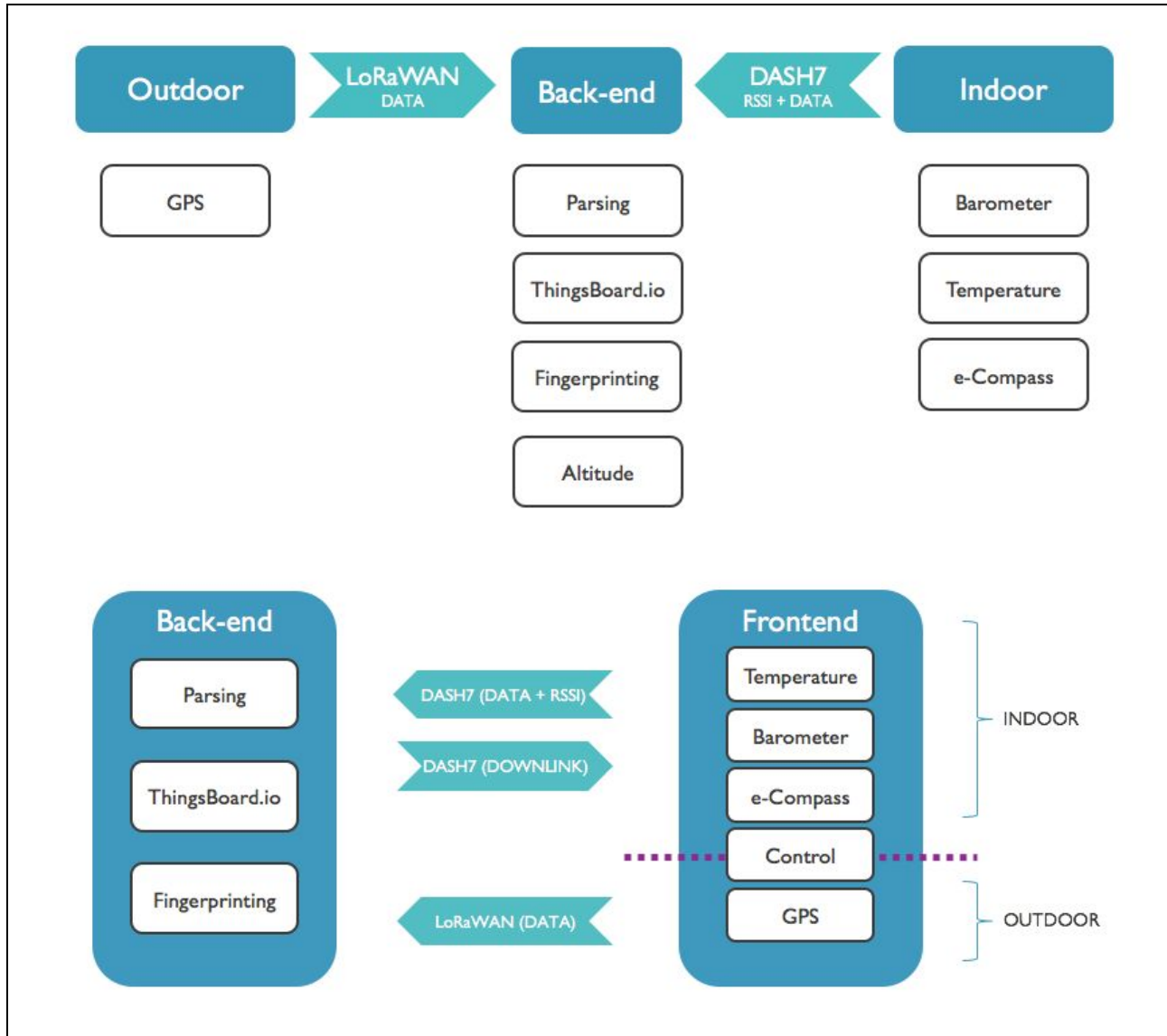
### Device Software

3. What edge applications do we need in our device software? (Examples: data acquisition, streaming to the cloud, analytics, local control, etc.)

Data acquisition, data processing if he/she leaves the safe zone

## Communications

4. Create a diagram of your communications topology for a single customer. Include any sensors, devices, gateways, 3<sup>rd</sup> party devices, and the cloud. Indicate whether connections will be wired or wireless.



5. Provide a brief explanation of why you chose this topology based on key communications parameters (power consumption, bandwidth, etc.).

**Dash7 indoor communication for low power consumption with small coverage.**  
**LoRa outside communication for low power consumption with a large coverage.**

## Cloud Platform

6. What is our top technology consideration for selecting a Cloud Platform, and why?

Convenience and ease of use

7. What is our top operational consideration for selecting a Cloud Platform, and why?

Stable and steady platform

8. What is our top business consideration for selecting a Cloud Platform, and why?

Price and performance

## Cloud Applications

9. For our various personas, what form factors do we need an application for? (Desktop, tablet, phone, wearable, in-vehicle dashboard, etc.)

Wearable and tablet/desktop for the nurse

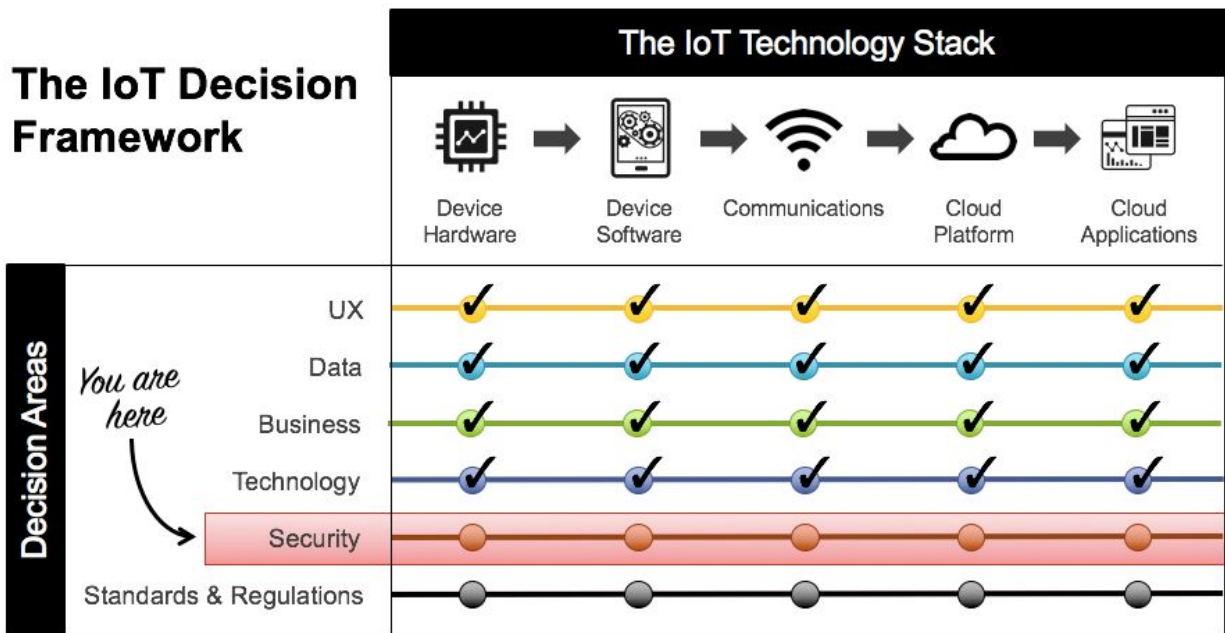
10. For each form factor, will we build a web app or a native app? Why?

Web app -> Ease of install and on almost every platform

Native app -> easy alerts when needed, convenient



## 7. Security Decision Area



1. What is the absolute worst thing that could happen to our company, our customers, society, or the environment if our system gets hacked?

Location information of every person gets out. Blueprints of building

2. What are the top ways each of the layers of the IoT technology stack could be compromised?

Device Hardware:	● Hack
Device Software:	● Hack
Communications:	● Too much information, wrong information send what leads to dows time
Cloud Platform:	● DDos
Cloud Applications:	● Hack

3. What are important internal steps our company will need to take to ensure a culture of security?

Everything needs to be hashed and coded correctly. No passwords made public

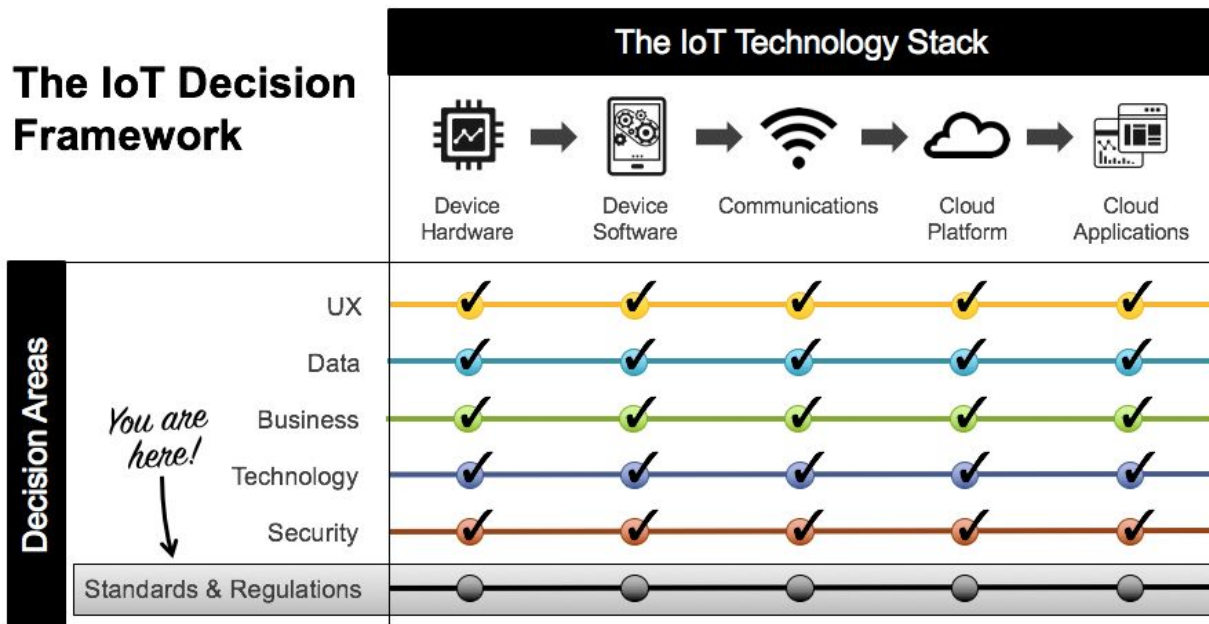
4. Will we hire a vendor / contractor to conduct security testing, or will we do it internally? Why?

Yes, because we are dealing with personal location data

5. What other security questions do we need to answer based on our application and industry?

Can people easily intercept our communication and read it? How safe is MQTT from interce

## 8. Standards & Regulations Decision Area



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1. What technical standards should we adhere to? (May not be applicable to all layers. For example: REST, TCP/IP, etc.)

Device Hardware:	•
Device Software:	• MQTT, HTTP
Communications:	• Dash7, LoRa
Cloud Platform:	• HTTP, MQTT
Cloud Applications:	•

2. What industry standards should we adhere to? (May not be applicable to all layers. For example, CAN in Automotive industry, BACNet in commercial buildings, Zigbee in home automation, etc.)

Device Hardware:	• LoRaWAN
Device Software:	•
Communications:	• Dash7, LoRa
Cloud Platform:	•
Cloud Applications:	•

3. What regulations will we have to follow for our industry and geography? (May not be applicable to all layers. For example: UL, HIPAA, FCC, FAA, etc.)

Device Hardware:	● LoRaWan standards
Device Software:	●
Communications:	● Dash7 and LoRa standards
Cloud Platform:	●
Cloud Applications:	●

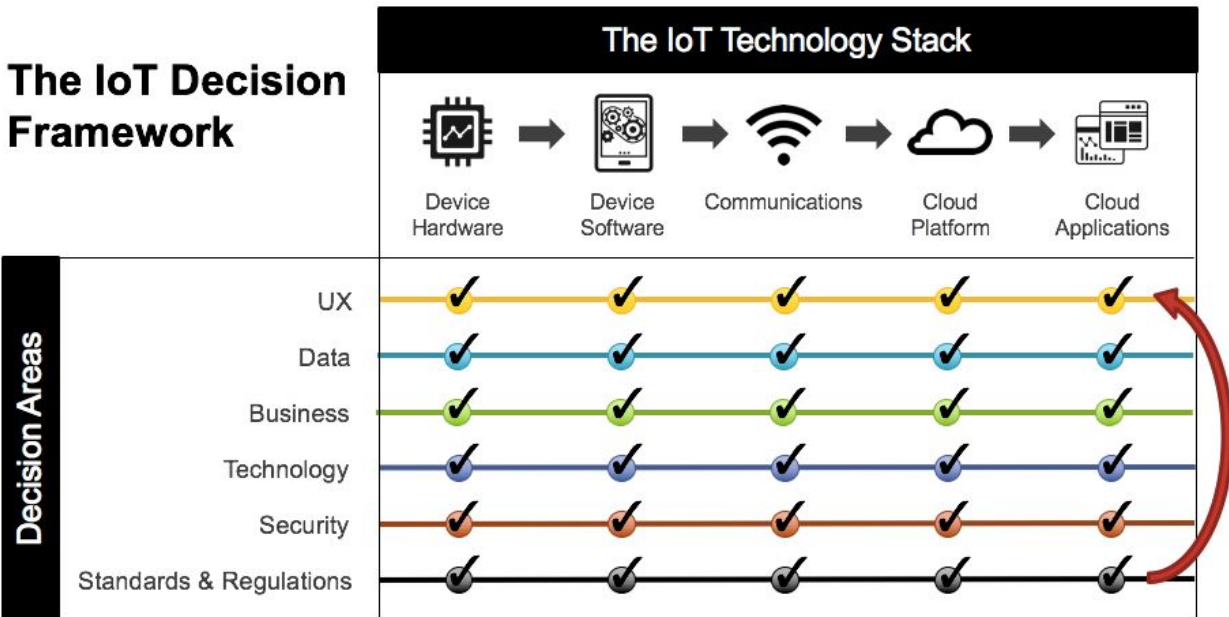
4. What employees or consultants will we need to manage regulation compliance?

Lawyer
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**Great job!**

Congratulations on completing your workbook! Now don't forget to go back and confirm that all your answers are consistent throughout all decision areas!

## The IoT Decision Framework



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