

# Choose the Right Hardware

## Proposal Template

### Scenario 1: Manufacturing

#### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
FPGA

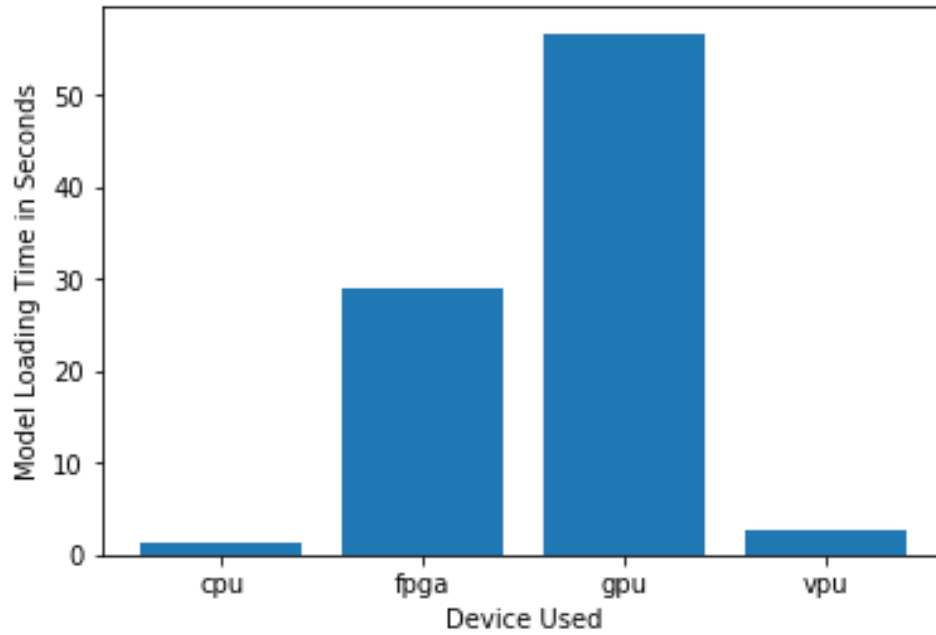
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>Client wants processing speed about to 30-35 FPS to detect no. of people in the factory line.</i>	<i>FPGAs can handle this much of high speed and low latency. Intel's Arria 10 FPGA or Intel Mustang-F100-A10 can be a better choice.</i>
<i>Cost is no bar for the Client</i>	<i>FPGA is a versatile option when cost does not matter much.</i>
<i>Client demands a flexible system with greater life span.</i>	<i>FPGAs are made with greater flexibility .It can be reprogrammed as and when required, even after manufacturing and development. FPGAs can last to 10 years 24*7 from the start of production.</i>

#### Queue Monitoring Requirements

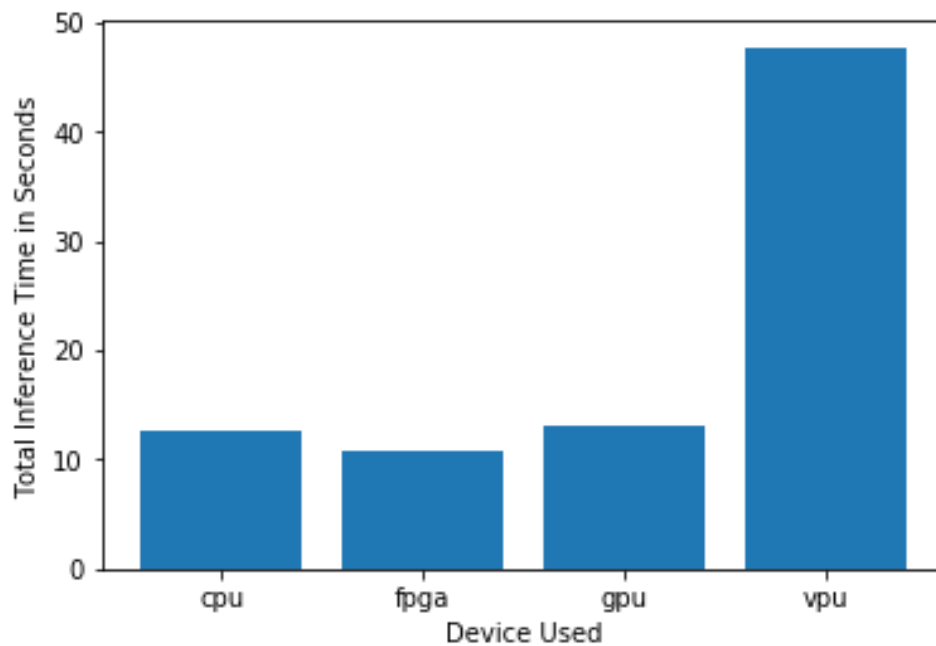
Maximum number of people in the queue	2
Model precision chosen (FP32, FP16, or Int8)	FP32

#### Test Results

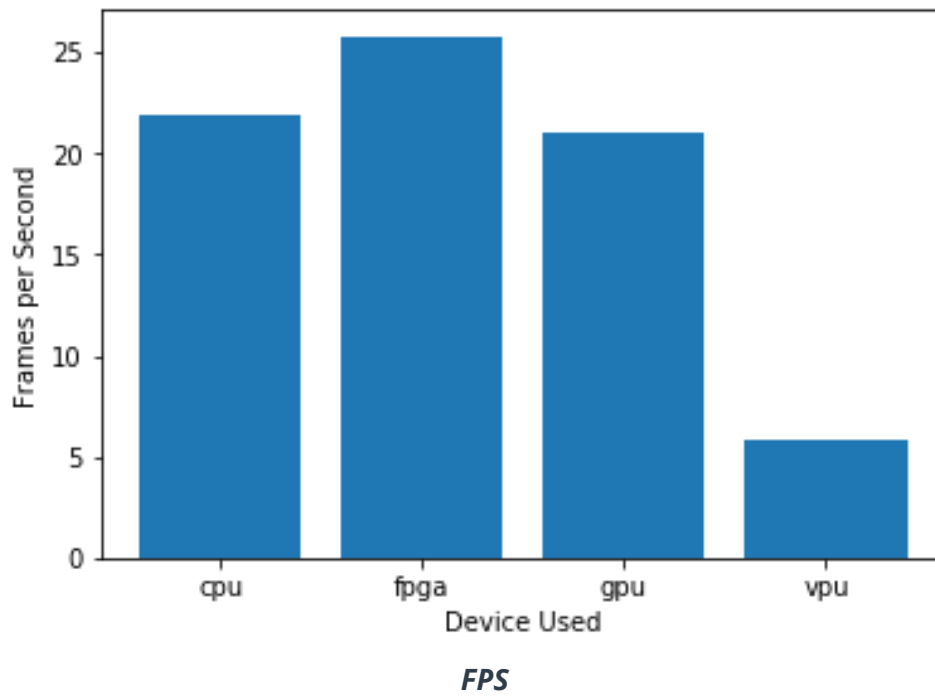
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



***Model Load Time***



***Inference Time***



## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

### Write-up: Final Hardware Recommendation

*FPGA is the final proposal for the manufacturing scenario as it meets clients requirements. Its high performance and low latency, ability to be reprogrammed and last long to 10+ years gives more power to stand out among other hardware options.*

## Scenario 2: Retail

### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

### Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)

*CPU*

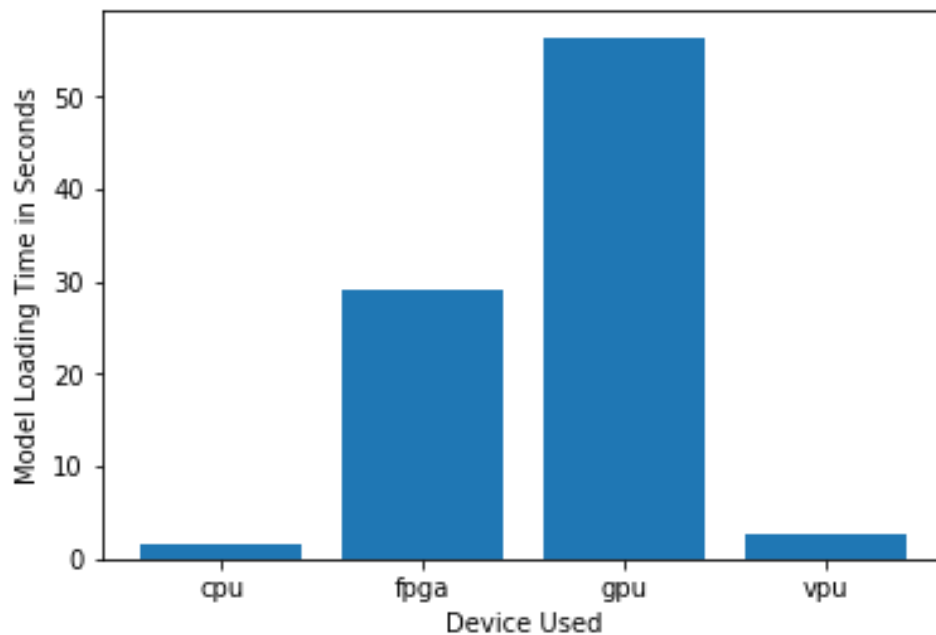
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>No budget to upgrade the existing system</i>	<i>Client has Intel's i7 core CPU, that's why there is no need to spend money on new hardware.</i>
<i>Client needs low power consumption hardware</i>	Client's CPU has a TDP of 130W, and can handle power consumption requirements.
<i>Some delay is allowed</i>	<i>Intel's i7 core CPU has 4GHz clock speed, frames can be processed within nanoseconds.</i>

## Queue Monitoring Requirements

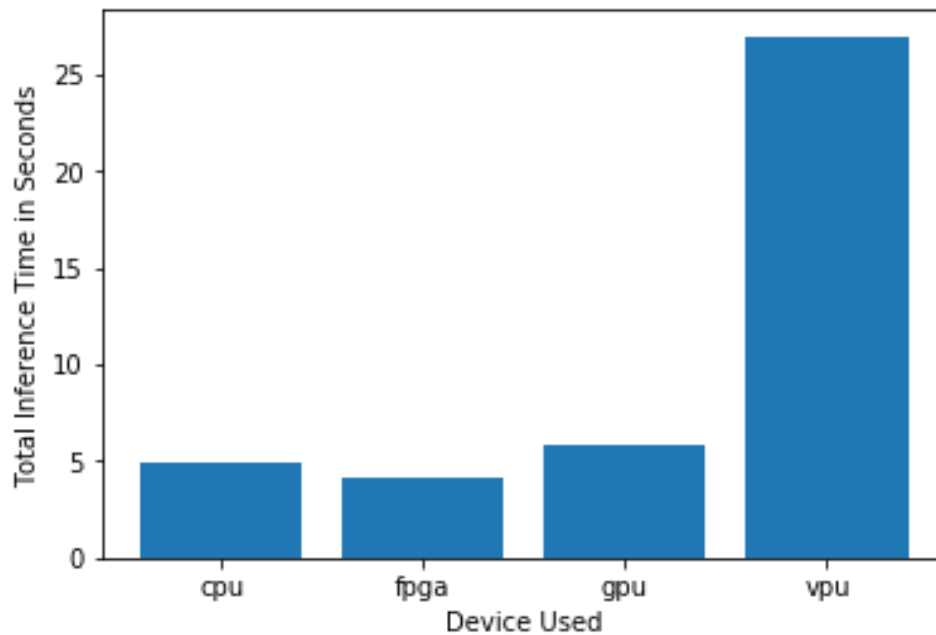
Maximum number of people in the queue	5 in rush hours and 2 in common hours
Model precision chosen (FP32, FP16, or Int8)	FP32

## Test Results

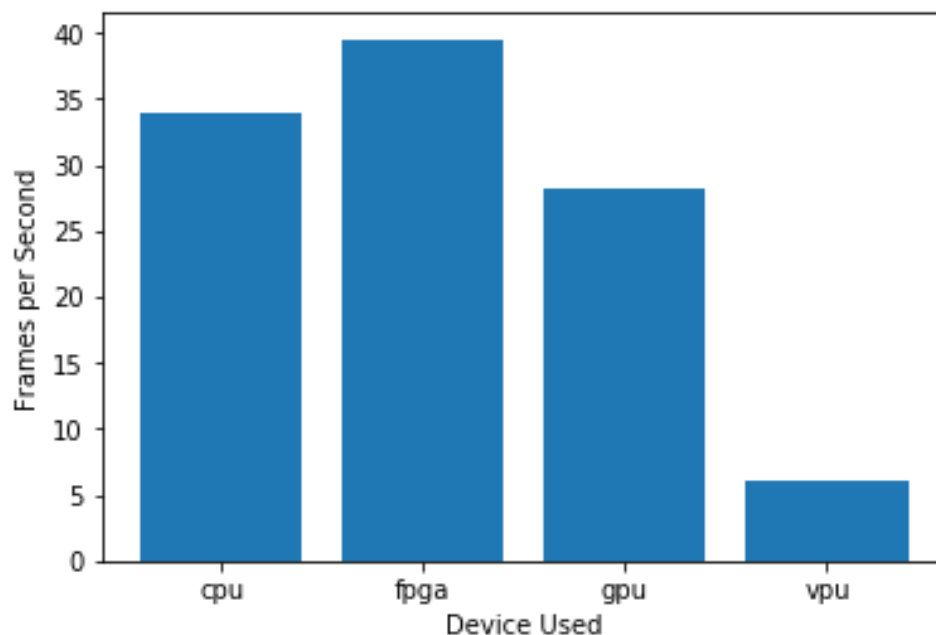
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



**Model Load Time**



*Inference Time*



*FPS*

## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

Write-up: Final Hardware Recommendation

*CPU found to be the best choice for the retail scenario. Existing CPUs can be utilized to its full potential and satisfy client needs. FPS in test results is out performing the client requirement for processing with i7 Core CPU. This makes the CPU - a natural choice.*

## Scenario 3: Transportation

### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
VPU

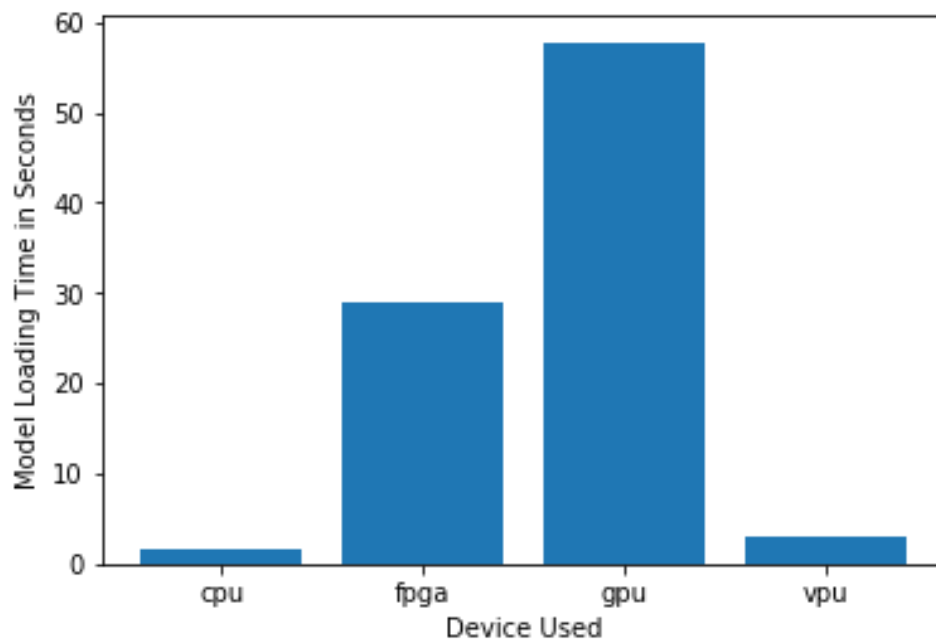
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
\$300 is maximum to buy new hardware/s	NCS2 amounts to \$125. It is in the client budget.
Client do not want to add more money to electricity bills	NCS2 has less than 1W power consumption.
7 CCTV cameras connected to PC requires high processing speed	Its USB-like interface can perform 1 Teraflop per second.

### Queue Monitoring Requirements

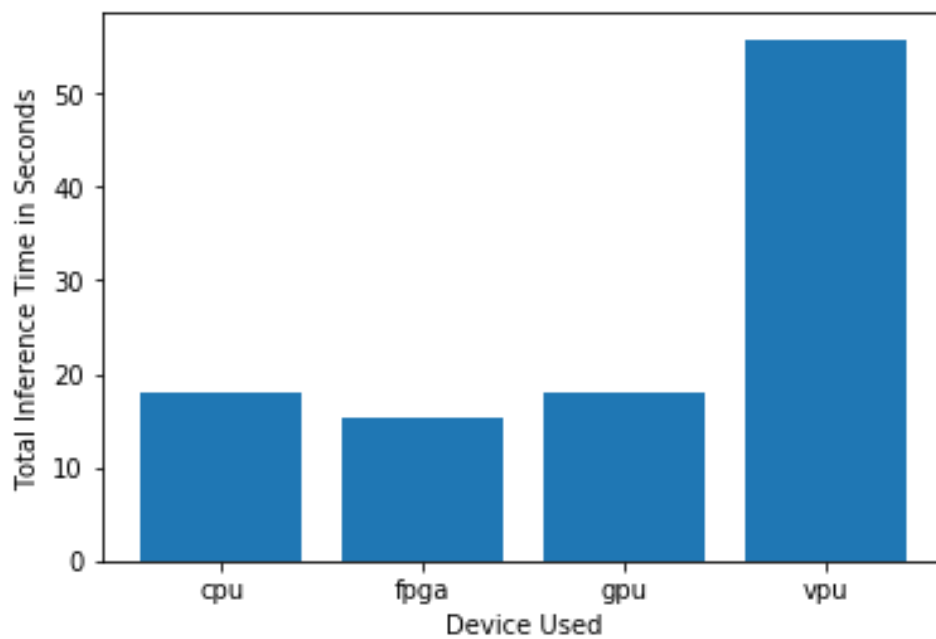
Maximum number of people in the queue	7-15 and 3 in average
Model precision chosen (FP32, FP16, or Int8)	FP16

### Test Results

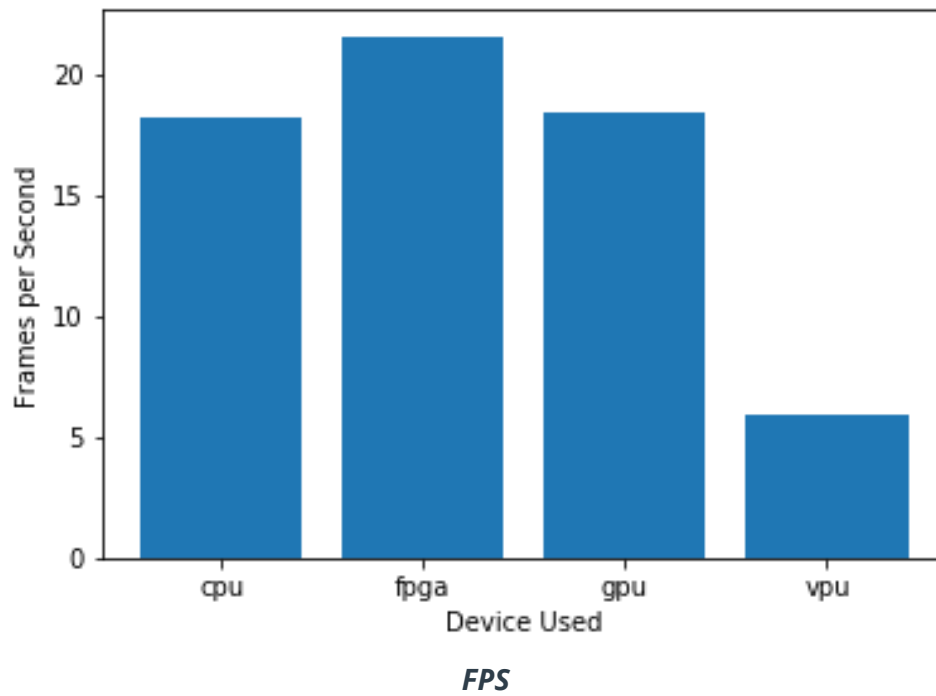
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



***Model Load Time***



***Inference Time***



## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

### Write-up: Final Hardware Recommendation

*Final hardware choice would be VPU or NCS2. It comes under \$300 and less power consumption than GPU and can work for long.*