

# 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

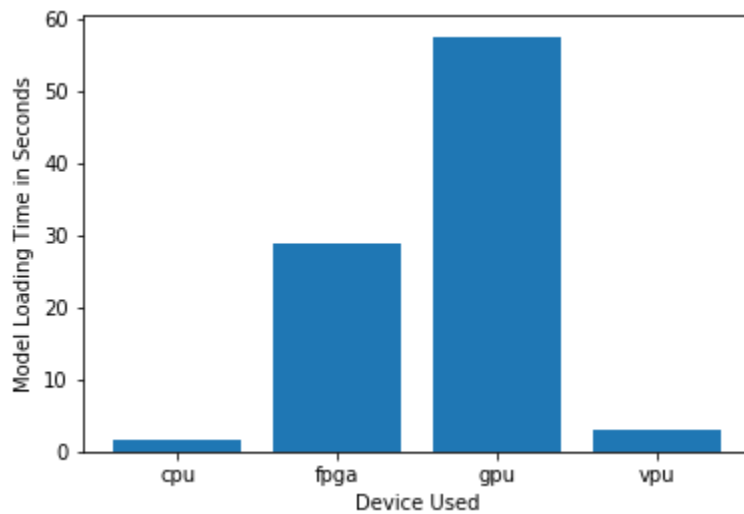
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Additionally, because there are multiple chip designs—and new designs are created regularly—the system would also need to be flexible so that it can be reprogrammed and optimized to quickly detect flaws in different chip designs.	<i>FPGA can be reprogrammed.</i>
While Naomi Semiconductors has plenty of revenue to install a quality system, this is still a significant investment and they would ideally like it to last for at least 5-10 years.	<i>FPGAs have a long lifespan. It's totally fit to run 10 years.</i>
Mr. Vishwas would like the image processing task to be completed five times per second.	<i>FPGA are high performance tools, they will totally do it.</i>

#### Queue Monitoring Requirements

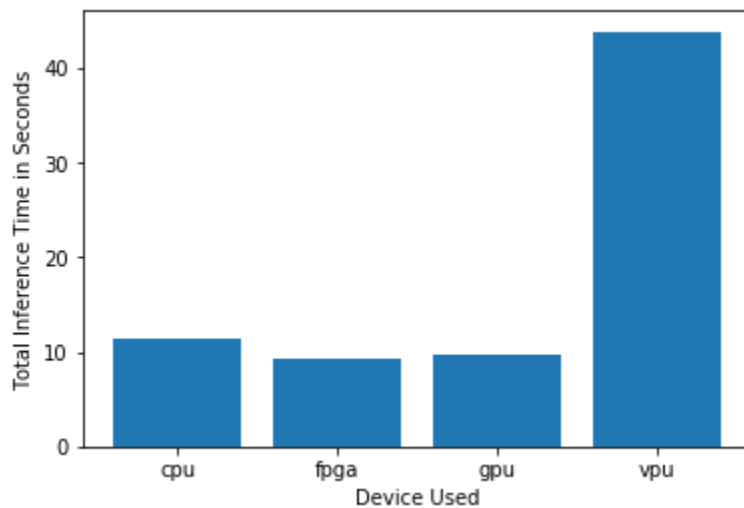
Maximum number of people in the queue	10
Model precision chosen (FP32, FP16, or Int8)	FP32 (CPU) or FP16 (iGPU)

## Test Results

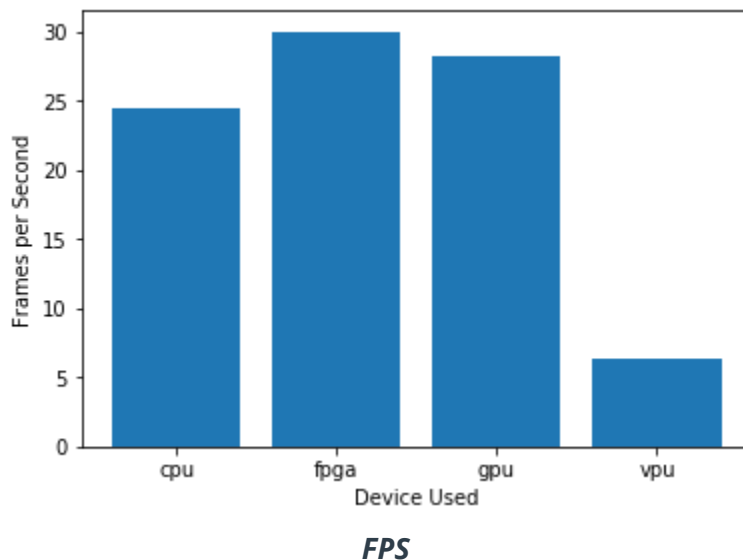
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



***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

*I still recommend the FPGA. It's the only one that will be reconfigured at wish, and the cost doesn't seem to be a problem to the client. Performance is there, so it's a go for me!*

## 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 or iGPU*

### Requirement Observed (Include at least two.)

### How does the chosen hardware meet this requirement?

*Example requirement:*

*Example explanation:*

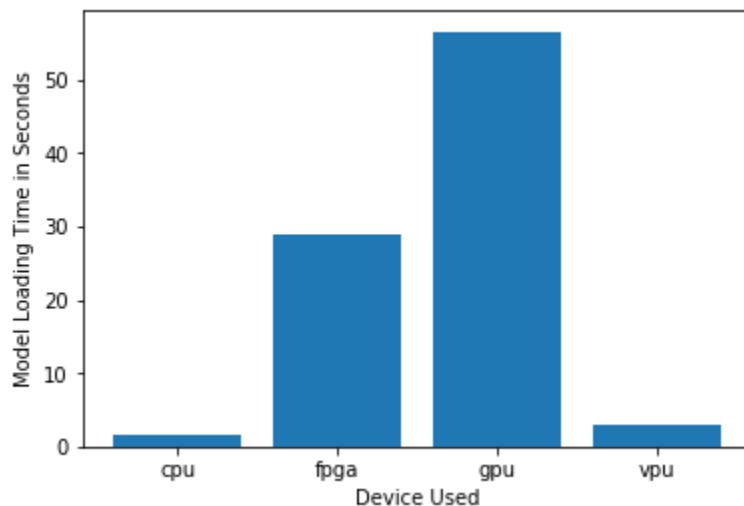
The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
As a result, Mr. Lin does not have much money to invest in additional hardware	<i>CPUs are already in place, with integrated GPUs. No hardware to add!</i>
, and also would like to save as much as possible on his electric bill.	<i>CPUs could be a better choice.</i>
<i>[TODO: Type your answer here]</i>	<i>[TODO: Type your answer here]</i>

## Queue Monitoring Requirements

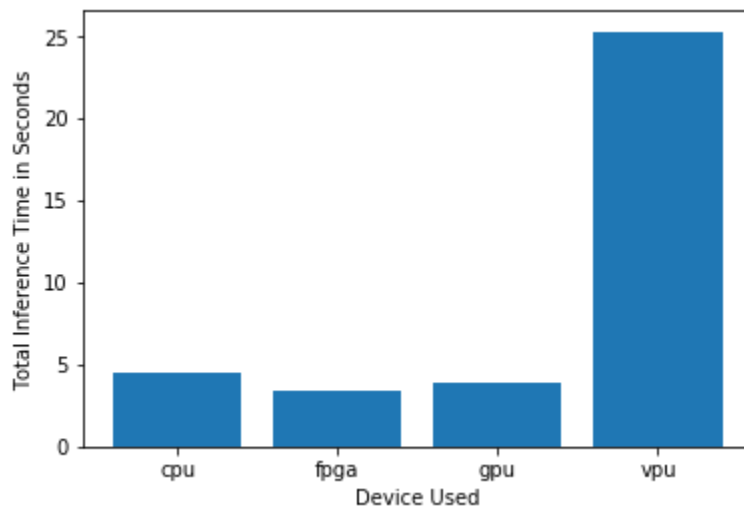
Maximum number of people in the queue	5
Model precision chosen (FP32, FP16, or Int8)	FP16

## Test Results

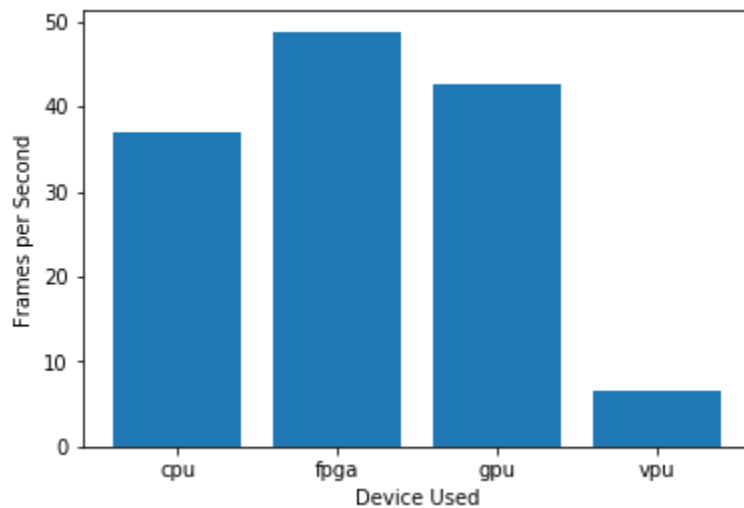
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



**Model Load Time**



***Inference Time***



***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

*In this case, it seems like the CPUs will do fine. There is a low loading time, and high FPS. When the client is ready to have more power, then we can switch to iGPUs.*

## 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

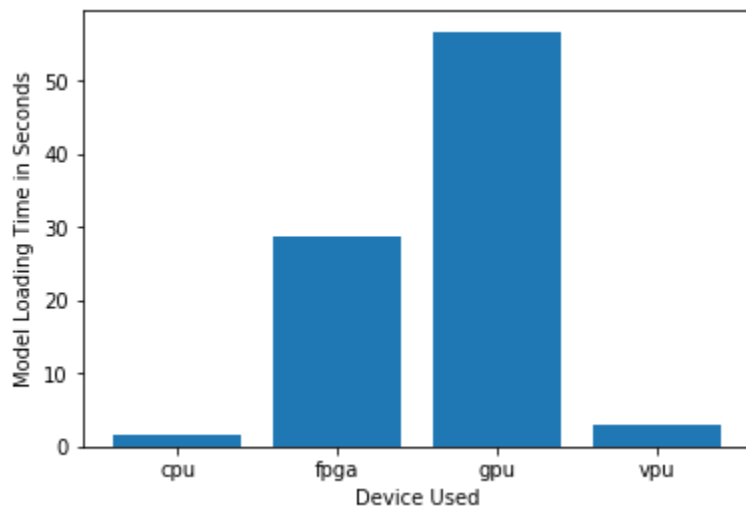
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
Ms. Leah's budget allows for a maximum of \$300 per machine, and she would like to save as much as possible both on hardware and future power requirements.	VPU cost 100\$
no significant additional processing power is available to run inference	VPU can do the work without leveraging CPU through Myriad X processor and USB 3
	[TODO: Type your answer here]

### Queue Monitoring Requirements

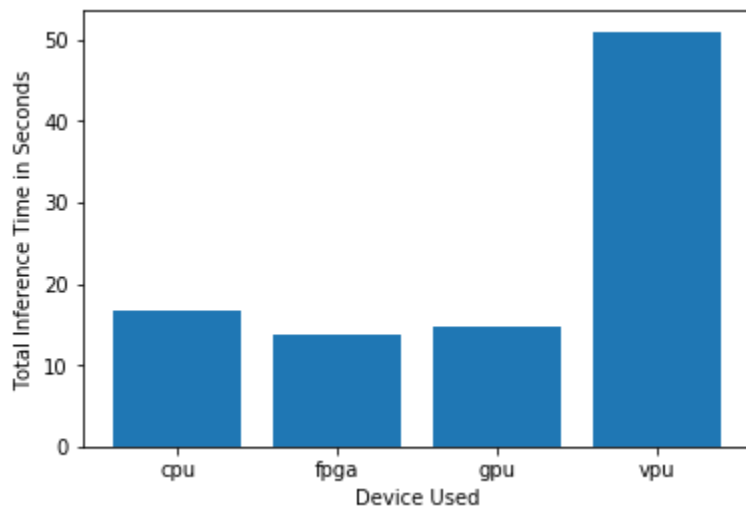
Maximum number of people in the queue	11
Model precision chosen (FP32, FP16, or Int8)	FP16 (NCS2 limitation)

### Test Results

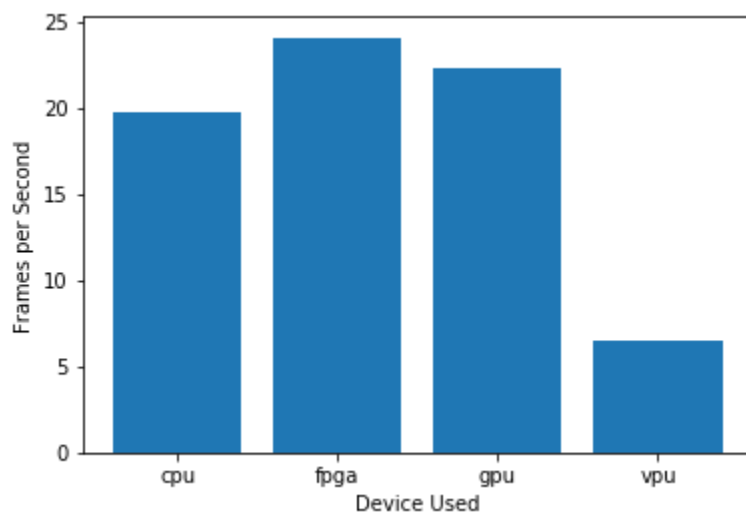
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



***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

*The VPU is not an "ideal" choice. With 5 or 6 FPS, it's definitely not as good as the others.  
The FPGA seems to be the better choice, but considering the budget, let's stick to VPUs and have an "okay" solution.*