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| --- |
| Kielce University of Technology  Faculty of Electrical Engineering, Automatic Control and Computer Science |
| Information Management Systems |
| Laptop Factory  Company ID in IFS Application C7  Login to the system is: D27 |

**(Report No 1)**

**DESCRIPTION OF CONSTANT DATA**

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**Description of the production process:**

Our company is called: e.g. LapMax The director is: <<first name and last name>> Its headquarters are: in Kielce The company is engaged in the production of laptops. We create two final products: an office laptop and a gaming laptop. In our company, we have 1 department, which deals with the production element:

* **Laptop Manufacturing Division**

Our company's products are of the highest quality. Almost 80% of all the products we use are manufactured in our factory. The products we buy are:

* Plastic
* Tin
* Copper
* Steel
* Screen
* Camera
* Insulation
* Motherboard
* Touchpad
* Battery

The full bill of materials used in the manufacturing process is shown in Table 1

**Tab 1 – Material Index**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Id | Name | Unit of measurement | Type | Lead time (Jed. Pla) | Total Lead Time (Unit Pla.) | Cost ($) | Total cost ($) | Lowest level of expansion | Warehouse |
| C7\_00 | Gaming Laptop | art | P | 1 | 6 | 8600 | 17200 | 0 | C7\_M1 |
| C7\_01 | Office Laptop | art | P | 1 | 6 | 8800 | 17600 | 0 | C7\_M1 |
| C7\_02 | Plastic | meter^2 | K | 1 | 1 | 10 | 20 | 5 | C7\_M1 |
| C7\_03 | Tin | kilogram | K | 1 | 1 | 10 | 20 | 5 | C7\_M1 |
| C7\_04 | Copper | kilogram | K | 1 | 1 | 20 | 40 | 5 | C7\_M1 |
| C7\_05 | Steel | kilogram | K | 1 | 1 | 50 | 100 | 5 | C7\_M1 |
| C7\_06 | Screen | art | K | 1 | 1 | 300 | 600 | 2 | C7\_M1 |
| C7\_07 | Camera | art | K | 1 | 1 | 100 | 200 | 2 | C7\_M1 |
| C7\_08 | Insulation | meter^2 | K | 1 | 1 | 20 | 40 | 5 | C7\_M1 |
| C7\_09 | Motherboard | art | K | 1 | 1 | 2000 | 4000 | 3 | C7\_M1 |
| C7\_10 | Touchpad | art | K | 1 | 1 | 100 | 200 | 3 | C7\_M1 |
| C7\_11 | Battery | art | K | 1 | 1 | 200 | 400 | 3 | C7\_M1 |
| C7\_12 | Top of Gaming Laptop | art | P | 1 | 3 | 1250 | 2500 | 1 | C7\_M1 |
| C7\_13 | Bottom of a Gaming Laptop | art | P | 1 | 5 | 7250 | 14500 | 1 | C7\_M1 |
| C7\_14 | Microphone  Gaming | art | P | 1 | 2 | 40 | 80 | 2 | C7\_M1 |
| C7\_15 | WiFi Antenna | art | P | 1 | 2 | 80 | 160 | 2 | C7\_M1 |
| C7\_16 | Cable to the screen | art | P | 1 | 2 | 40 | 80 | 2 | C7\_M1 |
| C7\_17 | Screen Frame v1 | art | P | 1 | 2 | 60 | 120 | 2 | C7\_M1 |
| C7\_18 | Screw for the screen frame | art | P | 1 | 2 | 60 | 120 | 2 | C7\_M1 |
| C7\_19 | Hinges | art | P | 1 | 2 | 60 | 120 | 2 | C7\_M1 |
| C7\_20 | Screen Housing | art | P | 1 | 2 | 20 | 40 | 2 | C7\_M1 |
| C7\_21 | External Components  Gaming | art | P | 1 | 4 | 3550 | 7100 | 2 | C7\_M1 |
| C7\_22 | Internal ComponentsGaming | art | P | 1 | 4 | 3520 | 7040 | 2 | C7\_M1 |
| C7\_23 | Charging Port No. 321 | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_24 | Port USB A | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_25 | Port USB C | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_26 | Port HDMI | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_27 | Audio Connector | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_28 | Port Ethernet | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_29 | Bottom Housing | art | P | 1 | 2 | 20 | 40 | 3 | C7\_M1 |
| C7\_30 | Palm rest | art | P | 1 | 2 | 20 | 40 | 3 | C7\_M1 |
| C7\_31 | Screw for bottom housing | art | P | 1 | 2 | 60 | 120 | 3 | C7\_M1 |
| C7\_32 | Gaming Keyboard | art | P | 1 | 3 | 2170 | 4340 | 3 | C7\_M1 |
| C7\_33 | Start button | art | P | 1 | 2 | 20 | 40 | 3 | C7\_M1 |
| C7\_34 | Screw for motherboard | art | P | 1 | 2 | 60 | 120 | 3 | C7\_M1 |
| C7\_35 | Cooling  Gaming | art | P | 1 | 3 | 210 | 420 | 3 | C7\_M1 |
| C7\_36 | Battery connector | art | P | 1 | 2 | 60 | 120 | 3 | C7\_M1 |
| C7\_37 | Gaming Speaker | art | P | 1 | 2 | 80 | 160 | 3 | C7\_M1 |
| C7\_38 | Mechanical switch | art | P | 1 | 2 | 70 | 140 | 4 | C7\_M1 |
| C7\_39 | Overlay set | art | P | 1 | 2 | 20 | 40 | 4 | C7\_M1 |
| C7\_40 | PCB | art | P | 1 | 2 | 40 | 80 | 4 | C7\_M1 |
| C7\_41 | Display-Port | art | P | 1 | 2 | 90 | 180 | 3 | C7\_M1 |
| C7\_42 | SD card reader | art | P | 1 | 2 | 80 | 160 | 3 | C7\_M1 |
| C7\_43 | Fan v1 | art | P | 1 | 2 | 40 | 80 | 4 | C7\_M1 |
| C7\_44 | Cooling mounting screw | art | P | 1 | 2 | 60 | 120 | 3 | C7\_M1 |
| C7\_45 | Keyboard  Office | art | P | 1 | 3 | 2170 | 4340 | 3 | C7\_M1 |
| C7\_46 | Office Speaker | art | P | 1 | 2 | 80 | 160 | 3 | C7\_M1 |
| C7\_47 | The top of the Office Laptop | art | P | 1 | 3 | 1250 | 2500 | 1 | C7\_M1 |
| C7\_48 | Bottom of Office Laptop | art | P | 1 | 5 | 7450 | 14900 | 1 | C7\_M1 |
| C7\_49 | External Components  Office | art | P | 1 | 4 | 3520 | 7040 | 2 | C7\_M1 |
| C7\_50 | Fan v2 | art | P | 1 | 2 | 40 | 80 | 4 | C7\_M1 |
| C7\_51 | Power Supply No. 321 | art | P | 1 | 2 | 40 | 80 | 1 | C7\_M1 |
| C7\_52 | Power Supply No. 544 | art | P | 1 | 2 | 40 | 80 | 1 | C7\_M1 |
| C7\_53 | Charging Port No. 544 | art | P | 1 | 2 | 100 | 200 | 3 | C7\_M1 |
| C7\_54 | Fingerprint reader | art | P | 1 | 2 | 80 | 160 | 3 | C7\_M1 |
| C7\_55 | Office Interior Components | art | P | 1 | 4 | 3750 | 7500 | 2 | C7\_M1 |
| C7\_56 | Screen Frame v2 | art | P | 1 | 2 | 60 | 120 | 2 | C7\_M1 |
| C7\_57 | Office Microphone | art | P | 1 | 2 | 40 | 80 | 2 | C7\_M1 |
| C7\_58 | Membrane Switch | art | P | 1 | 2 | 70 | 140 | 4 | C7\_M1 |
| C7\_59 | Office Cooling | art | P | 1 | 3 | 210 | 420 | 3 | C7\_M1 |

Note id – it must start with the name of the factory, e.g. A1\_

The structure of the product is shown in Table 2

**Tab 2 - Product structure**

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Id | Child id | Wear factors | Operation No. |
| C7\_00 | C7\_12 | 1 | 10 |
|  | C7\_13 | 1 | 20 |
|  | C7\_51 | 1 | 30 |
| C7\_12 | C7\_20 | 1 | 90 |
|  | C7\_18 | 8 | 80 |
|  | C7\_17 | 1 | 10 |
|  | C7\_16 | 1 | 30 |
|  | C7\_06 | 1 | 40 |
|  | C7\_19 | 2 | 20 |
|  | C7\_14 | 1 | 50 |
|  | C7\_07 | 1 | 70 |
|  | C7\_15 | 1 | 60 |
| C7\_13 | C7\_19 | 2 | 30 |
|  | C7\_21 | 1 | 20 |
|  | C7\_22 | 1 | 10 |
| C7\_51 | C7\_02 | 1 | 10 |
|  | C7\_04 | 1 | 10 |
| C7\_20 | C7\_02 | 1 | 10 |
| C7\_18 | C7\_05 | 1 | 10 |
| C7\_17 | C7\_05 | 1 | 10 |
| C7\_16 | C7\_04 | 1 | 10 |
|  | C7\_08 | 1 | 10 |
| C7\_19 | C7\_05 | 1 | 10 |
| C7\_14 | C7\_04 | 1 | 10 |
|  | C7\_02 | 1 | 10 |
| C7\_15 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_21 | C7\_23 | 1 | 20 |
|  | C7\_24 | 2 | 30 |
|  | C7\_25 | 1 | 40 |
|  | C7\_26 | 1 | 50 |
|  | C7\_27 | 1 | 60 |
|  | C7\_29 | 1 | 10 |
|  | C7\_30 | 1 | 130 |
|  | C7\_31 | 8 | 90 |
|  | C7\_32 | 1 | 120 |
|  | C7\_33 | 1 | 100 |
|  | C7\_10 | 1 | 110 |
|  | C7\_41 | 1 | 70 |
|  | C7\_28 | 1 | 80 |
| C7\_22 | C7\_09 | 1 | 10 |
|  | C7\_34 | 8 | 70 |
|  | C7\_35 | 1 | 40 |
|  | C7\_36 | 1 | 20 |
|  | C7\_11 | 1 | 60 |
|  | C7\_44 | 8 | 50 |
|  | C7\_37 | 1 | 30 |
| C7\_23 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_24 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_25 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_26 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_27 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_41 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_28 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_29 | C7\_02 | 1 | 10 |
| C7\_30 | C7\_02 | 1 | 10 |
| C7\_31 | C7\_05 | 1 | 10 |
| C7\_32 | C7\_38 | 30 | 20 |
|  | C7\_39 | 1 | 30 |
|  | C7\_40 | 1 | 10 |
| C7\_33 | C7\_02 | 1 | 10 |
| C7\_34 | C7\_05 | 1 | 10 |
| C7\_35 | C7\_43 | 2 | 10 |
|  | C7\_04 | 1 | 20 |
| C7\_36 | C7\_04 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
|  | C7\_08 | 1 | 10 |
| C7\_44 | C7\_05 | 1 | 10 |
| C7\_37 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_38 | C7\_05 | 1 | 10 |
|  | C7\_02 | 1 | 10 |
| C7\_39 | C7\_02 | 1 | 10 |
| C7\_40 | C7\_03 | 1 | 10 |
|  | C7\_04 | 1 | 10 |
| C7\_43 | C7\_02 | 1 | 10 |
|  | C7\_04 | 1 | 10 |
|  | C7\_08 | 1 | 10 |
| C7\_01 | C7\_47 | 1 | 20 |
|  | C7\_48 | 1 | 10 |
|  | C7\_52 | 1 | 30 |
| C7\_47 | C7\_20 | 1 | 90 |
|  | C7\_18 | 8 | 80 |
|  | C7\_56 | 1 | 10 |
|  | C7\_16 | 1 | 30 |
|  | C7\_06 | 1 | 40 |
|  | C7\_19 | 2 | 20 |
|  | C7\_57 | 1 | 50 |
|  | C7\_07 | 1 | 70 |
|  | C7\_15 | 1 | 60 |
| C7\_48 | C7\_19 | 2 | 30 |
|  | C7\_49 | 1 | 20 |
|  | C7\_55 | 1 | 10 |
| C7\_52 | C7\_02 | 1 | 10 |
|  | C7\_04 | 1 | 10 |
| C7\_56 | C7\_05 | 1 | 10 |
| C7\_57 | C7\_04 | 1 | 10 |
|  | C7\_02 | 1 | 10 |
| C7\_49 | C7\_53 | 1 | 20 |
|  | C7\_24 | 3 | 30 |
|  | C7\_25 | 1 | 40 |
|  | C7\_26 | 1 | 50 |
|  | C7\_27 | 1 | 60 |
|  | C7\_29 | 1 | 10 |
|  | C7\_30 | 1 | 140 |
|  | C7\_31 | 8 | 100 |
|  | C7\_45 | 1 | 130 |
|  | C7\_33 | 1 | 110 |
|  | C7\_10 | 1 | 120 |
|  | C7\_42 | 1 | 70 |
|  | C7\_54 | 1 | 80 |
|  | C7\_28 | 1 | 90 |
| C7\_55 | C7\_09 | 1 | 10 |
|  | C7\_34 | 8 | 70 |
|  | C7\_59 | 1 | 40 |
|  | C7\_36 | 1 | 20 |
|  | C7\_11 | 1 | 60 |
|  | C7\_44 | 8 | 50 |
|  | C7\_46 | 1 | 30 |
| C7\_53 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
|  | C7\_03 | 1 | 10 |
| C7\_42 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_54 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_45 | C7\_58 | 30 | 20 |
|  | C7\_39 | 1 | 30 |
|  | C7\_40 | 1 | 10 |
| C7\_59 | C7\_50 | 2 | 10 |
|  | C7\_04 | 1 | 20 |
| C7\_46 | C7\_04 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_58 | C7\_02 | 1 | 10 |
|  | C7\_05 | 1 | 10 |
| C7\_50 | C7\_02 | 1 | 10 |
|  | C7\_04 | 1 | 10 |
|  | C7\_08 | 1 | 10 |

The organizational structure is presented in Tables 3,4,5

**Tab 3 - Faculties**

|  |  |
| --- | --- |
| Faculty Id | Faculty Name |
| C7W01 | Laptop Manufacturing Division |

**Tab 4 - Production cells**

|  |  |
| --- | --- |
| Cell Id | Cell name |
| C7K00 | Production cell for the production of interfaces and connectors |
| C7K01 | Production cell for the production of small steel components |
| C7K02 | Production cell for the production of medium-sized steel components |
| C7K03 | Production cell for the production of electronic components |
| C7K04 | Production cell for the production of plastic parts |
| C7K05 | Production cell for the production of module components |
| C7K06 | Production cell for connecting modules |
| C7K07 | Production cell for assembling modules and components |
| C7K08 | Production cell for assembling laptop parts |
| C7K09 | Production cell for completing laptops |

**Tab 5 – Work Cells**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Socket id | Name | Cell Id | Faculty Id | Capacity/day [h] |
| C7G00 | Production cell for the production of interfaces and connectors | C7K00 | C7W01 | 8 |
| C7G01 | Production cell for the production of small steel components | C7K01 | C7W01 | 8 |
| C7G02 | Production cell for the production of medium-sized steel components | C7K02 | C7W01 | 8 |
| C7G03 | Production cell for the production of electronic components | C7K03 | C7W01 | 8 |
| C7G04 | Production cell for the production of plastic parts | C7K04 | C7W01 | 8 |
| C7G05 | Production cell for the production of module components | C7K05 | C7W01 | 8 |
| C7G06 | Production cell for connecting modules | C7K06 | C7W01 | 8 |
| C7G07 | Production cell for assembling modules and components | C7K07 | C7W01 | 8 |
| C7G08 | Production cell for assembling laptop parts | C7K08 | C7W01 | 8 |
| C7G09 | Production cell for assembling laptops | C7K09 | C7W01 | 8 |

The layout of the warehouses is shown in Tables 6 and 7

**Tab 6 - Locations**

|  |  |  |
| --- | --- | --- |
| Location Id | name | type |
| C7\_PROD | Factory\_LapMax | Inter-station |

**Tab 7 - Magazines**

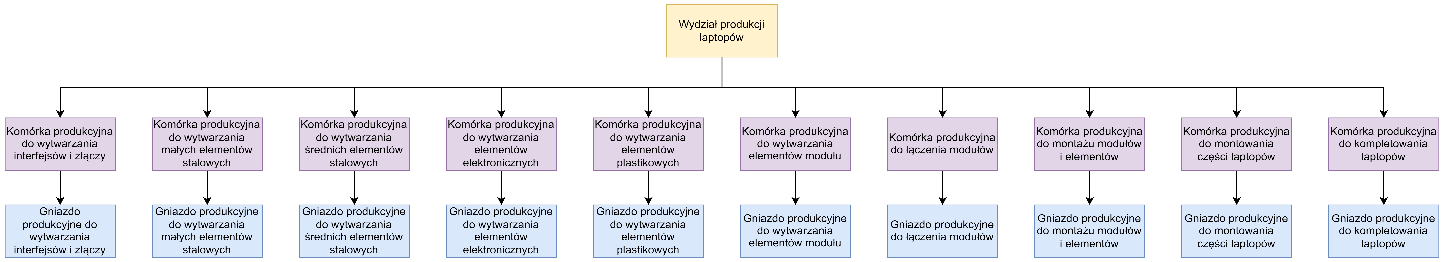
|  |  |  |
| --- | --- | --- |
| Warehouse ID | Warehouse name | Id Location |
| C7\_M1 | PROD1 | C7\_PROD |

The method of production is shown in Table 8

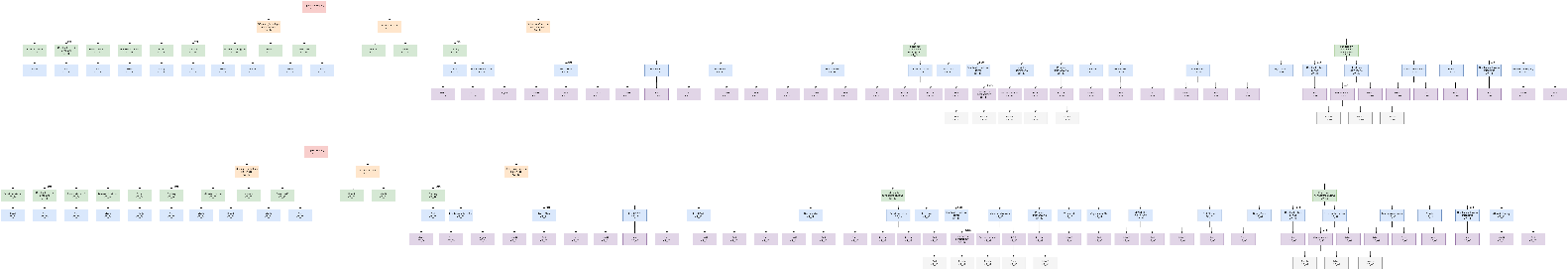
**Tab 8 – Routes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Id | Operation id | Operation name | Duration [sec/unit] | Socket id | Cell Id | Faculty ID |
| C7\_23 | 10 | Fabrication of charging port No. 321 | 500 | C7G00 | C7K00 | C7W01 |
| C7\_53 | 10 | Creation of charging port No. 544 | 500 | C7G00 | C7K00 | C7W01 |
| C7\_24 | 10 | Fabrication of the USB A port | 200 | C7G00 | C7K00 | C7W01 |
| C7\_25 | 10 | Fabrication of the USB C port | 200 | C7G00 | C7K00 | C7W01 |
| C7\_26 | 10 | Fabrication of the HDMI port | 200 | C7G00 | C7K00 | C7W01 |
| C7\_27 | 10 | Creating an audio port | 200 | C7G00 | C7K00 | C7W01 |
| C7\_28 | 10 | Fabrication of the Ethernet port | 200 | C7G00 | C7K00 | C7W01 |
| C7\_41 | 10 | Creating a DisplayPort | 200 | C7G00 | C7K00 | C7W01 |
| C7\_42 | 10 | Creation of an SD card reader | 200 | C7G00 | C7K00 | C7W01 |
| C7\_54 | 10 | Creation of a fingerprint reader | 200 | C7G00 | C7K00 | C7W01 |
| C7\_36 | 10 | Fabrication of the battery connector | 500 | C7G00 | C7K00 | C7W01 |
| C7\_18 | 10 | Fabrication of the screw for the screen frame | 100 | C7G01 | C7K01 | C7W01 |
| C7\_31 | 10 | Fabrication of the screw for the bottom housing | 100 | C7G01 | C7K01 | C7W01 |
| C7\_34 | 10 | Fabrication of the motherboard screw | 100 | C7G01 | C7K01 | C7W01 |
| C7\_44 | 10 | Fabrication of the cooling mounting screw | 100 | C7G01 | C7K01 | C7W01 |
| C7\_19 | 10 | Fabrication of the hinge | 200 | C7G02 | C7K02 | C7W01 |
| C7\_17 | 10 | Creation of frame v1 | 200 | C7G02 | C7K02 | C7W01 |
| C7\_56 | 10 | Creation of frame v2 | 200 | C7G02 | C7K02 | C7W01 |
| C7\_16 | 10 | Fabrication of the cable to the shield | 100 | C7G03 | C7K03 | C7W01 |
| C7\_14 | 10 | Manufacturing a gaming microphone | 200 | C7G03 | C7K03 | C7W01 |
| C7\_15 | 10 | Fabrication of a WiFi antenna | 100 | C7G03 | C7K03 | C7W01 |
| C7\_57 | 10 | Manufacture of an office microphone | 200 | C7G03 | C7K03 | C7W01 |
| C7\_37 | 10 | Manufacturing a gaming speaker | 300 | C7G03 | C7K03 | C7W01 |
| C7\_46 | 10 | Manufacture of an office speaker | 300 | C7G03 | C7K03 | C7W01 |
| C7\_51 | 10 | Manufacture of power supply No. 321 | 500 | C7G03 | C7K03 | C7W01 |
| C7\_52 | 10 | Manufacture of power supply no. 544 | 500 | C7G03 | C7K03 | C7W01 |
| C7\_20 | 10 | Fabrication of the screen housing | 500 | C7G04 | C7K04 | C7W01 |
| C7\_29 | 10 | Fabrication of the bottom casing | 500 | C7G04 | C7K04 | C7W01 |
| C7\_30 | 10 | Production of rest palms | 400 | C7G04 | C7K04 | C7W01 |
| C7\_33 | 10 | Creation of the start button | 50 | C7G04 | C7K04 | C7W01 |
| C7\_38 | 10 | Fabrication of a mechanical switch | 20 | C7G05 | C7K05 | C7W01 |
| C7\_39 | 10 | Fabrication of a set of overlays | 100 | C7G05 | C7K05 | C7W01 |
| C7\_40 | 10 | PCB fabrication | 300 | C7G05 | C7K05 | C7W01 |
| C7\_58 | 10 | Fabrication of a membrane switch | 20 | C7G05 | C7K05 | C7W01 |
| C7\_43 | 10 | Creation of fan v1 | 400 | C7G05 | C7K05 | C7W01 |
| C7\_50 | 10 | Creation of the v2 fan | 400 | C7G05 | C7K05 | C7W01 |
| C7\_32 | 10 | PCB Assembly | 150 | C7G06 | C7K06 | C7W01 |
|  | 20 | Installation of mechanical switches | 20 | C7G06 | C7K06 | C7W01 |
|  | 30 | Assembling the Aligner Kit | 50 | C7G06 | C7K06 | C7W01 |
| C7\_45 | 10 | PCB Assembly | 150 | C7G06 | C7K06 | C7W01 |
|  | 20 | Installation of membrane switches | 20 | C7G06 | C7K06 | C7W01 |
|  | 30 | Assembling the Aligner Kit | 50 | C7G06 | C7K06 | C7W01 |
| C7\_35 | 10 | Mounting Fans v1 | 150 | C7G06 | C7K06 | C7W01 |
|  | 20 | Copper Usage | 150 | C7G06 | C7K06 | C7W01 |
| C7\_59 | 10 | Mounting v2 fans | 150 | C7G06 | C7K06 | C7W01 |
|  | 20 | Copper Usage | 150 | C7G06 | C7K06 | C7W01 |
| C7\_21 | 10 | Assembling the Bottom Enclosure | 100 | C7G07 | C7K07 | C7W01 |
|  | 20 | Installation of charging port No. 321 | 100 | C7G07 | C7K07 | C7W01 |
|  | 30 | Assembling USB A ports | 50 | C7G07 | C7K07 | C7W01 |
|  | 40 | Assembling the USB C port | 50 | C7G07 | C7K07 | C7W01 |
|  | 50 | Assembling the HDMI port | 50 | C7G07 | C7K07 | C7W01 |
|  | 60 | Assembling the Audio Connector | 50 | C7G07 | C7K07 | C7W01 |
|  | 70 | Mounting the DisplayPort | 50 | C7G07 | C7K07 | C7W01 |
|  | 80 | Assembling the Ethernet port | 50 | C7G07 | C7K07 | C7W01 |
|  | 90 | Mounting the screw to the bottom housing | 10 | C7G07 | C7K07 | C7W01 |
|  | 100 | Assembling the start button | 10 | C7G07 | C7K07 | C7W01 |
|  | 110 | Assembling the Touchpad | 50 | C7G07 | C7K07 | C7W01 |
|  | 120 | Assembling a Gaming Keyboard | 50 | C7G07 | C7K07 | C7W01 |
|  | 130 | Installation of palm rests | 50 | C7G07 | C7K07 | C7W01 |
| C7\_22 | 10 | Assembling the Motherboard | 100 | C7G07 | C7K07 | C7W01 |
|  | 20 | Assembling the Battery Connector | 50 | C7G07 | C7K07 | C7W01 |
|  | 30 | Assembling a Gaming Speaker | 50 | C7G07 | C7K07 | C7W01 |
|  | 40 | Installing a Gaming Cooler | 50 | C7G07 | C7K07 | C7W01 |
|  | 50 | Installing the cooling mounting screws | 10 | C7G07 | C7K07 | C7W01 |
|  | 60 | Battery Assembly | 150 | C7G07 | C7K07 | C7W01 |
|  | 70 | Assembling the screws to the motherboard | 10 | C7G07 | C7K07 | C7W01 |
| C7\_49 | 10 | Assembling the Bottom Enclosure | 100 | C7G07 | C7K07 | C7W01 |
|  | 20 | Installation of the charging port No. 544 | 100 | C7G07 | C7K07 | C7W01 |
|  | 30 | Assembling USB A ports | 50 | C7G07 | C7K07 | C7W01 |
|  | 40 | Assembling the USB C port | 50 | C7G07 | C7K07 | C7W01 |
|  | 50 | Assembling the HDMI port | 50 | C7G07 | C7K07 | C7W01 |
|  | 60 | Assembling the Audio Connector | 50 | C7G07 | C7K07 | C7W01 |
|  | 70 | Assembling the SD card reader | 50 | C7G07 | C7K07 | C7W01 |
|  | 80 | Mounting the fingerprint reader | 50 | C7G07 | C7K07 | C7W01 |
|  | 90 | Assembling the Ethernet port | 50 | C7G07 | C7K07 | C7W01 |
|  | 100 | Mounting the screw to the bottom housing | 10 | C7G07 | C7K07 | C7W01 |
|  | 110 | Assembling the start button | 10 | C7G07 | C7K07 | C7W01 |
|  | 120 | Assembling the Touchpad | 50 | C7G07 | C7K07 | C7W01 |
|  | 130 | Assembling the Office Keyboard | 50 | C7G07 | C7K07 | C7W01 |
|  | 140 | Installation of palm rests | 50 | C7G07 | C7K07 | C7W01 |
| C7\_55 | 10 | Assembling the Motherboard | 100 | C7G07 | C7K07 | C7W01 |
|  | 20 | Assembling the Battery Connector | 50 | C7G07 | C7K07 | C7W01 |
|  | 30 | Assembling the Office Speaker | 50 | C7G07 | C7K07 | C7W01 |
|  | 40 | Installation of office cooling | 50 | C7G07 | C7K07 | C7W01 |
|  | 50 | Installing the cooling mounting screws | 10 | C7G07 | C7K07 | C7W01 |
|  | 60 | Battery Assembly | 150 | C7G07 | C7K07 | C7W01 |
|  | 70 | Assembling the screws to the motherboard | 10 | C7G07 | C7K07 | C7W01 |
| C7\_12 | 10 | Mounting the Screen Frame v1 | 50 | C7G08 | C7K08 | C7W01 |
|  | 20 | Installation of hinges | 50 | C7G08 | C7K08 | C7W01 |
|  | 30 | Mounting the cable to the screen | 50 | C7G08 | C7K08 | C7W01 |
|  | 40 | Mounting the screen | 50 | C7G08 | C7K08 | C7W01 |
|  | 50 | Assembling a Gaming Microphone | 50 | C7G08 | C7K08 | C7W01 |
|  | 60 | WiFi Antenna Assembly | 50 | C7G08 | C7K08 | C7W01 |
|  | 70 | Mounting the Camera | 50 | C7G08 | C7K08 | C7W01 |
|  | 80 | Mounting the screws to the screen frame | 10 | C7G08 | C7K08 | C7W01 |
|  | 90 | Assembling the Screen Enclosure | 50 | C7G08 | C7K08 | C7W01 |
| C7\_13 | 10 | Assembling Gaming Internal Components | 100 | C7G08 | C7K08 | C7W01 |
|  | 20 | Assembling External Gaming Components | 100 | C7G08 | C7K08 | C7W01 |
|  | 30 | Installation of hinges | 50 | C7G08 | C7K08 | C7W01 |
| C7\_47 | 10 | Mounting the Screen Frame v2 | 50 | C7G08 | C7K08 | C7W01 |
|  | 20 | Installation of hinges | 50 | C7G08 | C7K08 | C7W01 |
|  | 30 | Mounting the cable to the screen | 50 | C7G08 | C7K08 | C7W01 |
|  | 40 | Mounting the screen | 50 | C7G08 | C7K08 | C7W01 |
|  | 50 | Assembling the Office Microphone | 50 | C7G08 | C7K08 | C7W01 |
|  | 60 | WiFi Antenna Assembly | 50 | C7G08 | C7K08 | C7W01 |
|  | 70 | Mounting the Camera | 50 | C7G08 | C7K08 | C7W01 |
|  | 80 | Mounting the screws to the screen frame | 10 | C7G08 | C7K08 | C7W01 |
|  | 90 | Assembling the Screen Enclosure | 50 | C7G08 | C7K08 | C7W01 |
| C7\_48 | 10 | Assembly of internal office components | 100 | C7G08 | C7K08 | C7W01 |
|  | 20 | Installation of external office components | 100 | C7G08 | C7K08 | C7W01 |
|  | 30 | Installation of hinges | 50 | C7G08 | C7K08 | C7W01 |
| C7\_00 | 10 | Assembling the Bottom of a Gaming Laptop | 200 | C7G09 | C7K09 | C7W01 |
|  | 20 | Assembling the top of a gaming laptop | 200 | C7G09 | C7K09 | C7W01 |
|  | 30 | Attaching Power Supply No. 321 | 10 | C7G09 | C7K09 | C7W01 |
| C7\_01 | 10 | Assembling the bottom of the office laptop | 200 | C7G09 | C7K09 | C7W01 |
|  | 20 | Assembling the top of the office laptop | 200 | C7G09 | C7K09 | C7W01 |
|  | 30 | Attaching power supply No. 544 | 10 | C7G09 | C7K09 | C7W01 |

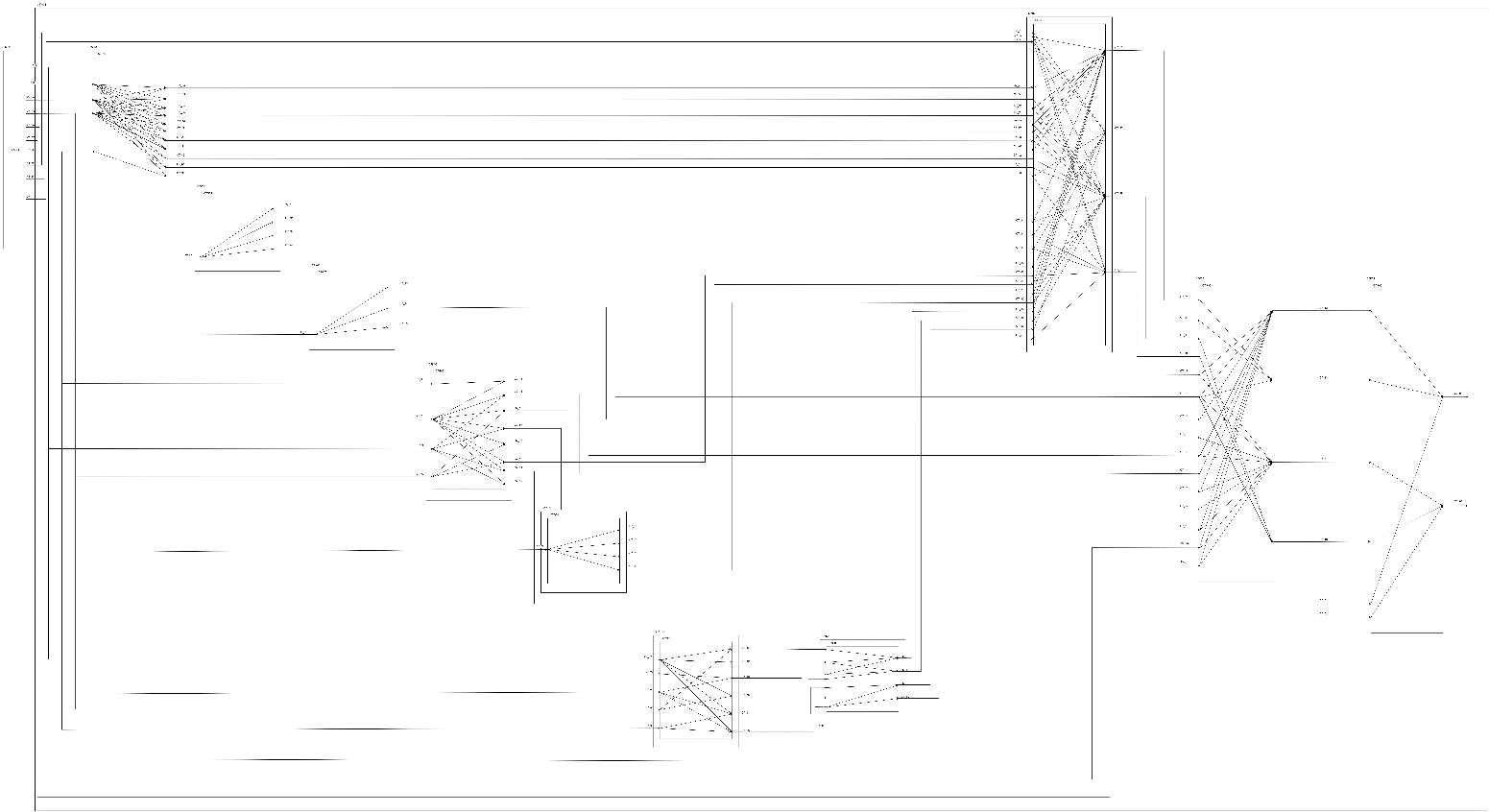
A general diagram of the factory is shown in Figure 1:

Fig 1. Factory Organization Chart

A graphical representation of the product structure is shown in Figure 2:

Fig 2. Graphical representation of the structure of the product

The flow of materials through the production stations is shown in Figure 3

 Fig 3. Flow of materials through production stations

The workload of work centers with a single order is shown in Table 9

**Tab 9 Unit Cumulative Order Load:**

|  |  |  |
| --- | --- | --- |
| Nest | Load [h] | Production capacity [h] |
| C7G00 | 1,44 | 8 |
| C7G01 | 1,78 | 8 |
| C7G02 | 0,67 | 8 |
| C7G03 | 0,67 | 8 |
| C7G04 | 0,81 | 8 |
| C7G05 | 0,78 | 8 |
| C7G06 | 0,61 | 8 |
| C7G07 | 0,75 | 8 |
| C7G08 | 0,46 | 8 |
| C7G09 | 0,23 | 8 |

The limit load for final orders is 4 products in one planning period.