Throughput time can be broken down into value added and non value added components.

**Value Added (VA) Definition:**

- Activities performed which the customer is willing to pay for. In “Industrial Engineering” talk, we say that value added work changes the 1) fit, 2) form, or 3) function of a part.

**Non Value Added (NVA) Definition:**

- Activities performed which the customer is not willing to pay for when purchasing our product. These are activities that our customer does not want, but our processes require them in order to complete the value added tasks.
Kano Model

Need not fulfilled

Satisfied

Excitement

Need well fulfilled

Performance

Basic

Dissatisfied

kano video
Defining Value

**Value Opportunities**
Value is broken down into specific attributes that contribute to a product’s usefulness, usability, and desirability.

**Emotion:** Contributes to the user experience by providing 1) adventure or exploration, 2) sense of freedom, 3) sense of security, 4) sensuality or luxury, 5) confidence or self assurance, and 6) power, control, or authority.

**Aesthetics:** Sensory perception of the product: 1) visual, 2) tactile, 3) auditory, 4) olfactory, and 5) gustatory.

**Product Identity:** Product must make a statement about individuality and personality and must fit into a context (place and time).

**Impact:** Top products have positive impacts on the lifestyle and social well-being of users and a minimal impact on the environment.

**Ergonomics:** Upper right products are intuitive and easy to use as well as comfortable and safe to use.

**Core Technology:** Upper right products enable new functionality and behavior through new technology and are expected to work reliably.

**Quality:** UR products feature good craftsmanship and manufacturing and are durable.

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**Lower Left:** Typically generic, well-established technologies. Minimal lifestyle impact, features, and technology. These products provide price driven functionality. Profit is made by high volume and low margin per item.  
*generic potato peeler, paper clip, step ladder*

**Lower Right:** Technology driven. Maximize features but ignore lifestyle concerns and ergonomics. Often a first of their type, so advantage comes from feature capabilities or enhancements. Often found in industrial or military applications. Profit is made by early adopters who will pay for new technology but is typically not sustainable.  
*business PCs, medical equipment, VCR, tape drives*

**Upper Left:** Products driven by style, typically focus on aesthetics but ignore ergonomics and features. Profit comes from consumers seeking new aesthetics and by misconceptions that new aesthetics corresponds to quality.  
*Michael Graves household products (Target), illogically branded products*

**Upper Right:** Products that integrate style and technology in order to add value to the consumer. These products differentiate themselves from the competition and define the state of the art. Sometimes cost more to design and produce but consumers are willing to pay more. Key words are useful, usable, and desirable.  
*iMacs (original), Starbucks, OXO Good Grips, iPod*
Value Positioning Map

- **VALUE POSITIONING**

  - **STYLE**
    - HIGH
    - LOW

  - **TECHNOLOGY**
    - LOW
    - HIGH
Value Positioning Map

<table>
<thead>
<tr>
<th>STYLE</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH</td>
</tr>
</tbody>
</table>
Examples?

• MP3 players?
• Cell phones?
• Sports complexes?
Take Away

• Identifying value is a central concept in lean X

• Engineers add value in design through creation of relevant knowledge

• Waste is prevalent in knowledge acquisition and management