Specification and Analysis of Information Systems

Lecture 4

OPM Advanced

Dr. Niva Wengrowicz
Summary of Previous Lectures
System Specification & Analysis

• Specifying the system **function**, **structure** and **behavior**

This is prepared after detailed **communications** with the **project team** and **customer**
Modeling Behavior
System Behavior

- Behavior defines the **dynamic relations** between components (calls and information exchanged).

- System dynamics deals with system **changes over time**.

- The **dynamic aspects** of a system is the complement to the **static aspects**.
What Do We Want to Capture?

- **What** happens between the components of the system?
  - In standard environments
  - In exceptional situations

- **When** it happens?
  - What are the cause/effect relations

- **How** it happens?
  - How events are ordered
  - How events are related
Modeling Behavior in OPM

- There is one diagram type in OPM which is designed to incorporate structure and behavior in one coherent frame of reference.

- OPM balances structural and procedural aspects of the system.

- OPM address the basic principles of the dynamics aspect of a system - Its behavior and the changes it undergoes over time.

- How OPM can be used to model this aspect?
  - **procedural links** (Transforming links & Enabling links)
  - **Events** (object related, time related-process invocation links)
  - **Condition**
  - **Time line**: flow of control (implicit invocation links)
Procedural Links

- **Transforming** – A transformee of a process is an object that undergoes a transformation as a result of the occurrence of the process. The transformation can be **construction**, **effect** (change of state) or **consumption**.

- **Enabling** – An enabler of a process is an object that must be present in order for that process to occur, but is not transformed as a result of the occurrence of the process.
Event link
An Event Is What Triggers a Process

- A **process cannot start spontaneously**.
- For a process to start executing, it needs to be **triggered**.
- In other words, it must get a **signal** telling it "start executing!"
- An **event** is a **significant point in time** from the system's perspective.
An Event Is What Triggers a Process

- By definition, an event is a **time-related concept**.

- Hence, **like** processes, **events happen** rather than exist.

- However, **unlike** a process, which takes a non-zero interval of time, an event is a **point in time**; it does not span across a time interval.
The Event Link

- An **event link** is an abstract **procedural link**
  - from an **object** $B$ to a process $P$
  - from a **state** $s$ of $B$ to a process $P$
  - from a **value** $v$ of $B$ to a process $P$

- The event link is denoted by small letter $e$, standing for event.
The Event Link

- There are two types of event links:
  - **consumption event link**
    - Object is consumed
    - B triggers P.
    - P consumes B.
  - **enabling event link**
    - Object remains unchanged
    - B triggers P.
    - P requires B.

- They are combinations of event link with a consumption and an enabling links, respectively.

*Can Construction or effect link serve as event links too? explain*
The Event Link

- There are two types of event links:
  - consumption event link
    - Object is consumed
  - enabling event link
    - Object remains unchanged

- They are combinations of event link with a consumption and an enabling links, respectively.

*Can Construction or effect link serve as event links too? explain*
Consumption (Transforming) Event Link Example

- The first type of event link is the consumption event link.

- The presence of Match is the event that triggers Igniting, which yields Bonfire.

- Match is consumed, as indicated by the consumption event link from Match to Igniting.
Consumption Event Link Example

Add Click Event triggers New Item Form Filling.

What if Data is NOT valid?
Consumption Event Link Example

Add Click Event triggers New Item Form Filling.

Data Valid triggers New Item Form Filling when it enters no.
New Item Form Filling consumes either no Data Valid or Add Click Event.
Loop flow with consumption event links

The same effect (Why?)
The second type of event link is the **instrument event link**.

The presence of **Flint Stone** is the event that triggers **Igniting**, handled by the agent **Boyscout**, which yields **Bonfire**.

Being an instrument, **Flint Stone** is not consumed, as indicated by the instrument event link.
Instrument Event Link Example

Asynchronous system
What is the execution order of these system?

What triggers each sub-process?

- Home Safety Maintaining
  - Burglary Handling
  - Fire Protecting
  - Earthquake Alarming
Instrument Event Link Example

Asynchronous system
What is the execution order of these system?
Object-related Events

- The events we have seen in examples so far were **object-related events**.
- They happened when:
  - a specific object class became existent or available
  - a certain object entered a specific state or assumed a specific value.
Time-related Events

- Events can also depend on a specific time in the system. These are **time-related events**.

Implicit invocation (time-line)  
Process invocation  
Exception invocation
**Time-related Events**

**Implicit Invocation links**

- Implicit invocation is invocation of process upon process termination within the context of an in-zoomed process.
- Process **invokes the process(es)** immediately **below it**.

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- **Product Terminating** zooms into **Product Finishing** and **Product Shipping**, in that sequence.
- **Processing** zooms into **parallel A and B**.
- **Processing** zooms into **A** and **parallel B and C**, in that sequence.
Time-related Events

Process Invocation links

- **Process invocation** is an **event** that triggers a **process** by a **process**.

- An **invocation link** is a link from a **process** to the **process** that it invokes (triggers), meaning that when the **invoking process terminates**, it **immediately triggers** the process at the other end of the invocation link.

Product Finishing **invokes** Product Shipping.
Time-related Events

Process Invocation links

Both constructs have the same meaning
Time-related Events

**Self Invocation links**

- **Self-invocation** is invocation of a **process by itself**
- When process terminate, the process immediately invokes itself.

Recurrent Processing invokes itself.
Time-related Events

Endless Loop example

- **Implicit Invocation links & Process Invocation links**
  - Process invokes the process(es) immediately below it
  - when p3 terminates, it immediately triggers Endless Loop Processing which invokes P1

![Diagram showing Endless Loop Processing with processes P1, P2, and P3](image)
Exception invocation is an event that triggers a process by timer.

- The invoker can be a process that has to be assigned with maximal acceptable time duration, which, if exceeded, triggers the invoked process.

A triggers B when it lasts more than 4 seconds.
Time-related Events

Exception invocation Link

Exception invocation is an event that triggers a process by timer.

- The invoker can be an assigned with maximal which, if exceeded, triggers the invoked process.

A triggers B when it lasts more than 4 seconds.
Time-related Events

Exception invocation Link example

Process duration constraint

Ringing triggers Voice Msg Recording when it lasts more than 10 seconds.
Time-related Events

Exception invocation Link example

Process duration constraint

Measured Temperature can be to cold, to hot, or ok.
Measured Temperature triggers Heating when it enters to cold.
Measured Temperature triggers Cooling when it enters to hot.
Measured Temperature triggers Idling when it enters ok.

Heating triggers Air Temperature Controlling when it lasts more than 1 minute.
Cooling triggers Air Temperature Controlling when it lasts more than 1 minute.
Idling triggers Air Temperature Controlling when it lasts more than 10 seconds.
Exception invocation is an event that triggers a process by timer.

- The invoker can be an object state that last more than maximal acceptable time duration, which, if exceeded, triggers the invoked process.

Oven triggers Off Turning when on (0..35m) lasts more than 35 minutes.
**Time-related Events**

**Exception invocation Link**

State duration constraint

- **Exception invocation** is an event that triggers a process by timer.

- The invoker can be an object state that lasts more than maximal acceptable time duration, which, if exceeded, triggers the process.

Oven triggers Off Turning when on (0..35m) lasts more than 35 minutes.
Time-related Events

Exception invocation Link example

State duration constraint

Voice Msg triggers Voice Msg Deleting when stay in inbox lasts more than 30 days.
Time-related Events

Exception invocation Link example

State duration constraint

Voice Msg triggers Voice Msg Deleting when stay in inbox lasts more than 30 days.
Condition link
Condition Link

- Enables conditional execution of a **process**:  
  - If the object *exist* or *is at the state* from which the condition link originates, then **execution** of the target process is **attempted**.
  
  - If the object does *not exist* or is *not in the state* linked to the condition link, then the **process is simply skipped**.

- Semantically, the condition link is similar to an "if...then" command.
There are two types of condition links:

- **Condition transforming links**
  - Object is changed

- **Condition enabling links**
  - Object remains unchanged

**Process occurs if Object exists, in which case Process consumes Object, otherwise Process is skipped.**

**Engineer handles Part Designing if Engineer is present, otherwise Part Designing is skipped.**

Can Construction or effect link serve as event condition links too? Explain
Condition Link

- There are two types of condition links:
  - Condition **transforming** links
    
    Object is changed
  
  
  - Condition **enabling** links
    
    Object remains unchanged

Can Construction or effect link serve as event condition links too? explain

- Process occurs if **Object** exists, in which case **Process** consumes **Object**, otherwise **Process** is skipped.

- Engineer handles **Part Designing** if **Engineer** is present, otherwise **Part Designing** is skipped.

- **A** occurs if **B** exists, in which case **A** affects **B**, otherwise **A** is skipped.
**Condition Link example**

- **Air Temperature Controlling**
  - **Temperature Measuring**
    - **Measured Temperature**
      - to cold
      - to hot

- **Heating**
- **Cooling**
- **Idling**

**Links:**
- Cooling occurs if Measured Temperature is to hot.
- Cooling triggers Idling when it lasts more than 1 minute.
- Heating occurs if Measured Temperature is to cold.
- Heating triggers Idling when it lasts more than 1 minute.
- Idling triggers Air Temperature Controling when it lasts more than 10 seconds.
“If then Else” Flow Example

Withdraw Processing occurs if Balance is >0.

Withdraw Declining occurs if Balance is else.
### Condition Link

**Permitted but not available in OPCAT**

<table>
<thead>
<tr>
<th>Name</th>
<th>Semantics</th>
<th>Sample OPD &amp; OPL</th>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition consumption link</td>
<td>If an object instance exists and the rest of the process precondition is satisfied, then the process executes and consumes the object instance, otherwise the control advances to trigger the next sequential process or returns one level up.</td>
<td><img src="Diagram1.png" alt="Diagram" /> Process occurs if Object exists in which case Process consumes Object, otherwise Process is skipped.</td>
<td>Conditioning object</td>
<td>Conditioned process</td>
</tr>
<tr>
<td>Condition effect link</td>
<td>If an object instance exists and the rest of the process precondition is satisfied, then the process executes and affects the object instance, otherwise the control advances to trigger the next sequential process or returns one level up.</td>
<td><img src="Diagram2.png" alt="Diagram" /> Process occurs if Object exists in which case Process affects Object, otherwise Process is skipped.</td>
<td>Conditioning object</td>
<td>Conditioned process</td>
</tr>
</tbody>
</table>
Table 12 — Condition state-specified transforming link summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Semantics</th>
<th>Sample OPD &amp; OPL</th>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition state-specified consumption link</td>
<td>The process executes if the object is in the state from which the link originates, otherwise the process is skipped.</td>
<td><img src="image" alt="Diagram" /></td>
<td>Conditioning specified state of the object</td>
<td>Conditioned process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition input-output-specified effect link</td>
<td>The process executes if the object is in the input state (from which the link originates) and changes the object from its input state to its output state, otherwise the process is skipped.</td>
<td><img src="image" alt="Diagram" /></td>
<td>Conditioning specified input state of the object</td>
<td>Triggered process</td>
</tr>
<tr>
<td>Name</td>
<td>Semantics</td>
<td>Sample OPD &amp; OPL</td>
<td>Source</td>
<td>Destination</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Condition input-specified effect link</td>
<td>The process executes if the object is in the input state (from which the link originates) and changes the object from its input state to any one of its states, otherwise the process is skipped.</td>
<td><img src="message.png" alt="Diagram" /></td>
<td>Conditioning specified input state of the object</td>
<td>Triggered process</td>
</tr>
<tr>
<td>Condition output-specified effect link</td>
<td>The process executes if the object is in the input state (from which the link originates) and changes the object from its input state to any one of its states, otherwise the process is skipped.</td>
<td><img src="stress-testing.png" alt="Diagram" /></td>
<td>Conditioning object</td>
<td>Triggered process</td>
</tr>
</tbody>
</table>

Delivered Attempting occurs if **Message is created**, in which case **Delivery Attempting changes Message from created**, otherwise **Delivery Attempting is skipped.**

**Stress Testing** occurs if **Suspicious Component exists**, in which case **Stress Testing changes Suspicious Component to stress-tested**, otherwise **Stress Testing is skipped.**
Skip vs Wait semantics
Condition Links vs. Non-condition Links

What is the difference between Heating and Cooling In the diagram?
Skip vs Wait semantics
Condition Links vs. Non-condition Links

- **Condition** and **non-condition** links enables process execution only if the **object** instance from which the link originates **exists**.

  Similar: If the **precondition** is **true**, execute the process.

- The **difference** between the two link kinds is with respect to process execution in case of a **negative precondition evaluation**:

  - **condition** link - If a precondition evaluation fails, the process is **skipped**.

    If the precondition is true, execute the process
    
    ```
    else skip
    ```

  - **Non-condition** - if a precondition evaluation fails, the process **wait**.

    If the precondition is true, execute the process
    
    ```
    else wait until the precondition becomes true*
    ```

* For this to happen, a new event must trigger the process again, causing the precondition evaluation to repeat.
Advanced event-condition Issues
An event link specifies a **source event** and a **destination process** to activate on event occurrence.

- Triggering a process initiates an **attempt to execute** the process, but it **does NOT guarantee success** of this attempt.

- The **triggering event** forces an **evaluation of the process’ precondition**, which, if and only if satisfied, allows the process to become active.

- **The event shall be lost** - If the precondition is not satisfied, process execution does not occur **until another event** activates the process.
Event-Condition-Action - Example

What happens if trigger is active and condition is null?

Event - Condition - Action - Example

When Trigger is active Action Process will occur but only if Condition is satisfied.
Event is trying to trigger a process once. If the condition is not satisfied when the event happens, it is lost!

What happens if trigger is active and condition is null?

When **Trigger** is active **Action** can not be executed — condition is null.

Process will occur but only if **Condition** is satisfied.

Event-Condition-Action - Example

<table>
<thead>
<tr>
<th></th>
<th>Trigger</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>active</td>
<td>satisfied</td>
</tr>
<tr>
<td></td>
<td>not active</td>
<td>null</td>
</tr>
</tbody>
</table>
What is the right sentence here?

We change the **Condition Link** (from “satisfied”) to **Event Link**.

What happens if **trigger** is active and **condition** is null?
What is the right sentence here?

We change the **Condition Link** (from “satisfied”) to **Event Link**

What happens if trigger is active and condition is null?

The relation among event links is always XOR!!!

**Action** is triggered if **Trigger** is active **or** **Condition** is satisfied

The relation among event links is always XOR!!!
Event vs. Condition Enabling Links

What are the differences between the models?

**Condition**
- Starting process pre-condition evaluation depends on time line.
- Case state can change any time before pre-condition process evaluation.

**Event**
- Starting process pre-condition evaluation does not depend on time line but on state change.
- Case state cannot be changed any time before pre-condition process evaluation.

Only Condition Case (CB) will be executed.
If Condition Case would yield the condition Case, Event Case would be executed too.
EB and EA will be executed in that order.
Event vs. Condition Enabling Links

What are the differences between the models?

- Starting process pre-condition evaluation depends on time line.
- Case state can change any time before pre-condition process evaluation.

Only CB will be executed.
If CB would yields the c Condition Case CC process would be executed too.

EB and EA will be executed
In that order.

- Starting process pre-condition evaluation do not depends on time line but on state change.
- Case state can not be changed any time before pre-condition process evaluation.
Logical Operators
Boolean condition with Procedural Links

- Separate, non-touching links shall have the semantics of logical **AND**

Pre condition

Key A & Key B & Key C & closed safe
**Boolean condition with Procedural Links**

- A group of two or more procedural links of the same kind that originate from, or arrive at, the same object represent **OR / XOR**

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XOR operator mean **exactly one** of the things

OR operator mean **at least one** of the two or more
Table 17 — Summary of XOR and OR converging consumption and result links

<table>
<thead>
<tr>
<th>Converging consumption link fan</th>
<th>XOR</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1" alt="Diagram XOR" /></td>
<td><img src="image2" alt="Diagram OR" /></td>
</tr>
<tr>
<td></td>
<td><strong>P</strong> consumes exactly one of <strong>A</strong>, <strong>B</strong>, or <strong>C</strong>.</td>
<td><strong>P</strong> consumes at least one of <strong>A</strong>, <strong>B</strong>, or <strong>C</strong>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Converging result link fan</th>
<th>XOR</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image3" alt="Diagram XOR" /></td>
<td><img src="image4" alt="Diagram OR" /></td>
</tr>
<tr>
<td></td>
<td><strong>Exactly one of</strong> <strong>P</strong>, <strong>Q</strong>, or <strong>R</strong> <strong>yields</strong> <strong>B</strong>.</td>
<td><strong>At least one of</strong> <strong>P</strong>, <strong>Q</strong>, or <strong>R</strong> <strong>yields</strong> <strong>B</strong>.</td>
</tr>
</tbody>
</table>
Table 18 — Summary of XOR and OR diverging consumption and result link fans

<table>
<thead>
<tr>
<th></th>
<th>XOR</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverging consumption link fan</td>
<td><img src="image" alt="Diagram" /> B → P → Q → R</td>
<td><img src="image" alt="Diagram" /> B → P → Q → R</td>
</tr>
<tr>
<td></td>
<td>Exactly one of P, Q, or R consumes B.</td>
<td>At least one of P, Q, or R consumes B.</td>
</tr>
<tr>
<td>Diverging result link fan</td>
<td><img src="image" alt="Diagram" /> P → A → B → C</td>
<td><img src="image" alt="Diagram" /> P → A → B → C</td>
</tr>
<tr>
<td></td>
<td>P yields exactly one of A, B, or C.</td>
<td>P yields at least one of A, B, or C.</td>
</tr>
<tr>
<td></td>
<td>XOR</td>
<td>OR</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td><strong>Multiple objects effect link fan</strong></td>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>P affects exactly one of A, B, or C.</td>
<td>P affects at least one of A, B, or C.</td>
</tr>
<tr>
<td><strong>Multiple processes effect link fan</strong></td>
<td><img src="image3.png" alt="Diagram" /></td>
<td><img src="image4.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Exactly one of P, Q, or R affects P.</td>
<td>At least one of P, Q, R affects P.</td>
</tr>
</tbody>
</table>
Table 20 — Agent and instrument link fans

<table>
<thead>
<tr>
<th></th>
<th><strong>XOR</strong></th>
<th><strong>OR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agent link fan</strong></td>
<td><img src="image1" alt="Diagram" /> B handles exactly one of P, Q, or R.</td>
<td><img src="image2" alt="Diagram" /> B handles at least one of P, Q, R.</td>
</tr>
<tr>
<td><strong>Instrument link fan</strong></td>
<td><img src="image3" alt="Diagram" /> Exactly one of P, Q, or R requires B.</td>
<td><img src="image4" alt="Diagram" /> At least one of P, Q, R requires B.</td>
</tr>
</tbody>
</table>
Same logic behavior for other types of procedural links such as invocation, event, condition.
Path
State Changes with Paths

- Button Pushing changes Light state from on to off and vice versa

How can I model that?
State Changes with Paths

- Button Pushing changes Light state from on to off and vice versa
State Changes with Paths

- Button Pushing changes Light state from on to off and vice versa
Simulation
Simulation
Simulation
Simulation
Simulation

Diagram:

- Item Adding
  - New Item Form Data
  - New Item Form Filling
  - Data Checking
  - Data Valid?
    - yes
    - no
  - Item Record Creating
- Item Set
- Item
Simulation

```
Item Adding

New Item Form Data → New Item Form Filling

Data Checking

Data Valid? yes no

Item Record Creating

Item Set

Item
```
Simulation
Simulation

Instrument link is not satisfied because Object Data Valid has no instances at State yes.
Simulation
Simulation

- Item Adding
  - New Item Form Data
  - New Item Form Filling
- Data Checking
- Data Valid:
  - yes
  - no
- Item Record Creating
- Item Set
- Item
Simulation

[Diagram showing a process flow with nodes such as 'New Item Form Data', 'New Item Form Filling', 'Data Checking', 'Data Valid?', 'Item Record Creating', 'Item Set', and 'Item']
Simulation

Diagram showing the process of item adding with steps like new item form data, new item form filling, data checking, and item record creating.
Simulation

Diagram:

- Item Set
- Item
- Item Adding
- Relationship indicated by a line with a star symbol

Legend:
- Item Set
- Item
- Item Adding
- Relationship
פרקILogger של תחומ (scope ודרישות) (requirements) (םוקה קזרה)
– הקדמה המתרחשת את מטרת המערוכ והתיירות של (םוקה קזרה)
– תיאור הפונקציות של המערוכ והפונקציות המרכזיות לשיאפשו לችור
– פונקציות של 2 (כסמה פונקציות מרכזיות)
– הגדלת מושגים מרכזים הקשורים לואנטולוגיות שלמערכות (עבוב מי שלא
– בקיא בועלות התוכן).
– טבלת הדרישות המותחות (בסביבות 10 דרישות מרכזיות בחאת חתחום
– טבלת הדרישות מותחות (בסביבות 10 דרישות מרכזיות בחאת חתחום
– לכל דרישה יש להגדיר מה התהליך שבתומים דרישה זו (בחאת
– ליתוח הקים בהגהשה זה) ואן מהון עם הפיתורים המרכזית אشرح דרישה ל.schedule
– דרישת זה.

פרק ובו המודל של OPM אشرح כי:
– 디יאגרמת - SD1.1; SD1.2; ) SD1 (in-zooming) (unfoldning)
– הפיתורים יכל ליתוח לתהליך סינכרוניים (in-zooming) (in-zooming)
– תשוחה יאגרמת מוספת אشرح יפרטים של תהליך סינכרוניים (in-zooming) (in-zooming)
– SD1.3 (unfoldling) (unfoldning)
– תיאור המבנה של שתי ישיבות ממיד מרכזיות.
Model Evaluation

- Model clarity & understandability
- Model completeness
- Model correctness
- Documentation
Model clarity & understandability

• Model that clearly describes what the system does and all its processes - diagrams that are not overloaded with processes and objects - only what is needed in each diagram

• Meaningful names that create OPL understandable - avoid spaghetti-like connections - readable fonts - use of colors, fonts, sizes, comments and more

.scaling
.state suppressing
.in-zooming
.unfolding

Shimshon ben b

Shimshon meshuvotim ziotirim meshpetim OPLموكين

הيمنוט מספגטי של הקישור

פונטים קרויים

Shimshon ben betzuoim gedliim, haruot vod

Marokhim naotim b'ndibrim" (le ezruh lo mafzoa mid)

Moel Shimshon ma uosha ha'meurechat ola'ot ha'thalik ba

דייגרמות ולא עמוסות بمכלולים ואובייקטים רק מה שנדרש

בכל ה디יגרמות

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Model completeness

- Specification and Analysis of Information Systems – Spring Semester 2014

• Model completeness

- Specification and Analysis of Information Systems – Spring Semester 2014

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Model correctness

שימשו נקוני במבנה סינכרוני ואסנכרוני של התהליכים

ש mostra תואמים לקונבניצית השמות

כל התהליכים מחוברים לאובייקטים (ברור מיכל תחילר עבודה)

שימשו נקוני הבנדים פיזיים ומימדים, מערכתיים

וא出入境ים

שימשו נקוני באובייקטים בטור תהליך وماחרת לא

שימשו נקוני בקשירים תהליכיים

שימשו נקוני בקשירים מבנים

שימשו נקוני של הדירישנות – המערクト מתנגחת על פי

מה שמובוש

Documentation

• تيار ميلولي كزر شل المعوقت
• הצגת התיחום של المعوقת عم הסבר לעביו המיקוד
• תיאור מילולי كزر شل كل דייאגרמה – מה היא מכילה
• הסבר של שיקולי דעת במקומאות רלוונטיים
• הוספת הערות מקומיות היכן שנדרש
• ניסוחים ברורים וקולחים – נוח לקרוא
• לא להכביר במילים – לכותב רק מה שיש ולערכ
•教训

mosaf لكلリア

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הנחיות וوزارة תוספת – באתה הקורס

משאבי עוד לא פרויקטים

הנחיות ל蜇שת בינימ (גסה ראשה)

First submission example - עבורה לזרמה ל蜇שת ראשה

תיפשים לべית המודלים ותכתב העבורה
יוצרו ושאלות

• פורום השאלות באטר הקורס עומד לרשותכם

• בישוע הרבא – מגנשי יוערי קבוצתיים

• יש להירשם לפגישת הייעוץ – עוביו אחר ההנחיות – שיעופצו במלון השבעה.

• יש להgiatan מוכנים להכן שאלות מראות