Justice In Time: Applying TOC to Law Courts Systems

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How would you schedule and manage a typical district court?

- 13,000 incoming cases/year
- WIP of 15,000 cases
- 3 pre-trial meetings/case (avg.)
- 7 evidence meetings/case (avg.)
- 87 different types of cases, for each there is a different procedure
- 20 “Mega” cases
- 4 parties per case (avg.)
- 52 judges with different skills and specialization
- Uncertainty in
  - No. of meetings
  - No. of witnesses
  - Probability to close the case by settlement

Can current TOC current tools cope with this environment?
Or we need a good comprehensive model to resolve the problem...

- **Gouy-Chapman**

\[ 2 \left( \frac{d\psi}{dx} \right) \frac{d(\frac{d\psi}{dx})}{dx} = - \frac{g_1}{e} \leq C_i 0 Z \cdot F_{ek} \left( -\frac{2ze}{kT} \right) \frac{d\psi}{dx} \]

- **Charge Density**

\[ G_S = - \int_0^\infty \left( -\frac{e}{4\pi} \frac{d^2\psi}{dx^2} \right) dx = \int_0^\infty \frac{e}{4\pi} d \left( \frac{d\psi}{dx} \right) \]

- **Simplifies to:**

\[ G_S = \frac{e \cdot x}{4\pi} \frac{\sinh (A \cdot 2\psi)}{AZ} \]

- **Huckel Field:**

\[ V = \frac{2\beta E \varepsilon}{4\pi D} \int F(ka) \]
Same problems everywhere...

**Worldwide Survey:**

- Increasing demand
- Increasing OE
- Long lead time
- Diminishing throughput
- Dissatisfaction of the public
Compared to other complex systems

- Less flexibility: processes cannot be changed without legislation or regulation
- Judges’ autonomy
- Professional culture, not a managerial one
- 50% of the participants act against the system…
The social aspect

Justice delayed is justice denied…
Results of using new TOC concepts for 2 years

In pilot implementations:

- **Lead Time reduced by 47%**
- **Throughput increased by 43%**
- **Judicial quality improved**
1. Identify a “giant”

2. Identify the enormity of the area not addressed by the “giant”

3. Get on the “giant’s” shoulders

4. Identify the conceptual difference between the reality that was improved so dramatically by the “giant” and the area untouched

5. Identify the wrong assumption

6. Conduct the full analysis to determine the core problem, solution, etc.
SOG1: Identify a “giant”

- Goldratt’s Theory Of Constraints, especially the Focusing Steps and the Drum-Buffer-Rope mechanism
The challenges:

- Tackling the complexity of law courts management
- Tackling the improper functioning of the Law Courts that led to **poor public trust** and **high cost of doing business**
SOG3: Understand the “giant’s” solution

- Multiple processes, one bottleneck, one DBR
- DBR to reduce WIP and to increase T
- Time buffer to secure bottleneck’s starvation
- Linear flow per process
- Homogenous bottleneck resource
- Processes well-known and validated
- Central planning and control
The judiciary process

1. **Incoming cases**
   - **Pre-trial phase**
     - **Pre-trial sessions**
       - **Final pre-trial session**
         - **Evidence sessions**
           - **Summation**
             - **Ruling**
               - **Settlement**

The diagram outlines the judicial process, starting with incoming cases, progressing through various phases including pre-trial sessions, final pre-trial sessions, evidence sessions, summation, and leading to a ruling and subsequent settlements.
SOG4: The conceptual difference of the area untouched

- Procedures and protocols dictated by law and regulation
- Judges are autonomous
- Lack of managerial culture
- 50% of players act against the system
SOG4: The conceptual difference of the area untouched (cont.)

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  - No. of meetings
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This level of complexity demands a different approach
### SOG5: Identify the wrong assumptions

<table>
<thead>
<tr>
<th><strong>The “giant”</strong></th>
<th><strong>“SOG”</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>One DBR per bottleneck</td>
<td>Double DBR per judge – Frequency DBR and Release DBR</td>
</tr>
<tr>
<td>DBR to reduce WIP</td>
<td>Frequency DBR to reduce open Evidence cases WIP</td>
</tr>
<tr>
<td>Linear flow per process</td>
<td>Multi-iterative flow per process</td>
</tr>
<tr>
<td>Homogenous bottleneck resources</td>
<td>Heterogenic judges – skills and specialization</td>
</tr>
<tr>
<td>Central planning and control</td>
<td>Autonomous judges</td>
</tr>
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</table>
SOG 6: Full analysis of solution

• The 5 Focusing Steps are not sufficient, hence we suggest using the 7 Focusing Steps

• Converting an “Optimizer” mind-set into a “Satisficer” one
Step 1: Determine the system’s goal

- Providing “ruling” rather than mitigation

- Justice in the Global sense, rather than locally optimize the specific case: “… taking into account the need to allot resources to other cases” (Lord Woolf)

- Seeking for “win-win” rather than “compromises and balances”
Step 2: Determine the systems’ performance measures

- **Throughput** – number of closed cases
- **Operating Expenses** – cost of resources (including judges)
- **Inventory** – number of open cases

These measures are not sufficient, hence:

- **Lead Time** – case cycle time from the parties’ standpoint
- **Quality** – % of accepted appeals (?)
- **Due Date Performance** – % cases finished within the Service Level Agreement (SLA)
Step 3: Identify the system’s constraints

- The Judges are the Bottleneck
**Step 4: Exploit the system’s constraint**

- **Strategic Gating (SG)**
- **Reduction of Ineffective Time**

- **Alternative Dispute Resolution (ADR), False claims**

- **Over 50% ineffective time**
Step 5: Subordinate the rest of the system to the constraint

Tactical subordination:

- Lawyers and Prosecutors
- Police and Correction Auth.
- Witnesses
- Experts
- Administration
- Legal aides
A need for a differential solutions for each phase:

<table>
<thead>
<tr>
<th></th>
<th>Pre-trial phase</th>
<th>Evidence phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of cases</td>
<td>100%</td>
<td>40%</td>
</tr>
<tr>
<td>Effort per case</td>
<td>1 hour</td>
<td>4 days</td>
</tr>
</tbody>
</table>
A mandatory comprehensive pre-trial session: a “kick-off “ meeting

• Preparing the complete kit for the evidence phase
• Strategic gating on adversaries
• “25/25” on witnesses and content
• Planning and scheduling witnesses
• Scheduling oral summations meeting
### Differential solutions for each phase:

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<td>1 hour</td>
<td>4 days</td>
</tr>
<tr>
<td><strong>Daily Time frame</strong></td>
<td>8-10 AM</td>
<td>10AM – 17PM</td>
</tr>
<tr>
<td><strong>Scheduling</strong></td>
<td>Nearest available slot</td>
<td>Double Drum-Buffer-Rope (dDBR)</td>
</tr>
</tbody>
</table>
Double DBR (dDBR)

- Level 1: Frequency DBR
- Level 2: Release DBR
Frequency DBR

Before:

• Un-planned hearing
• WIP = 60 cases

After:

• Weekly hearing
• WIP = 5 cases
The effect of hearing frequency on Buffer size:

**Buffer size is proportional to sessions’ frequency**

| a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | a | b | c |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Unplanned hearing: WIP = 18

| a | a | a | b | b | b | c | c | c | c | d | d | d | d | e | e | e | f | f | f | f | g | g | g | g |
| a | a | a | b | b | b | c | c | c | c | d | d | d | d | e | e | e | f | f | f | f | g | g | g | g |

Day-To-Day hearing: WIP = 1

| a | b | c | d | e | a | b | c | d | e | a | b | c | d | e | a | b | c | d | e | f | g | h | i | j | f |... |

Weekly hearing: WIP = 5
### Frequency DBR analysis in evidence hearing

<table>
<thead>
<tr>
<th></th>
<th>Un-planned hearing</th>
<th>Weekly hearing</th>
<th>Day-to-day hearing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start</strong></td>
<td>Early</td>
<td>Late</td>
<td>Very late</td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>Late</td>
<td>Early</td>
<td>Very early</td>
</tr>
<tr>
<td><strong>Uncertainty risk</strong>*</td>
<td>1 day max</td>
<td>1 day max</td>
<td>4 days max</td>
</tr>
<tr>
<td><strong>Risk mitigation (fillers)</strong></td>
<td>Not required</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Lead Time (LT)</strong></td>
<td>High</td>
<td>Low</td>
<td>Very low</td>
</tr>
<tr>
<td><strong>Quality (Q)</strong></td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Throughput (T)</strong></td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Buffer</strong></td>
<td>High</td>
<td>Low</td>
<td>Very low</td>
</tr>
</tbody>
</table>

*Assuming 4 evidence days per case
Conflict resolution by a win-win solution:
- Day-to-day hearing for “Mega” cases
- Weekly hearing for all other cases
Color zones for releasing new cases (per judge):

<table>
<thead>
<tr>
<th>Next available slot for evidence hearing</th>
<th>Color zone</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;8 months</td>
<td>Green</td>
<td>Acceptable</td>
</tr>
<tr>
<td>8-12 months</td>
<td>Yellow</td>
<td>Late</td>
</tr>
<tr>
<td>&gt; 12 Months</td>
<td>Red</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

Red zone corrective actions:

• Court-flour clean-up, overtime, mobilization

• Court’s vice-president / president halts/chokes the release of new cases to the judge
Double Drum-Buffer-Rope (dDBR)

- Evidences buffer size: according to the hearing frequency

- Total buffer size: according to the color-zone mechanism

Necessary condition:

closing rate > opening rate

We achieved it by reducing the ineffective time and offloading the judges’ load
Almost every judge has a legal aide for offloading.
Step 7: Go back to step 3

The notion of Permanent Bottlenecks
A District Court in Israel – applying the 7 focusing steps and dDBR for civil cases:

<table>
<thead>
<tr>
<th></th>
<th>Pre Pilot Cases (Months)</th>
<th>Pilot Cases (Months)</th>
<th>% Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final pre-trial to Ruling</td>
<td>22</td>
<td>12</td>
<td>-47%</td>
</tr>
<tr>
<td>Total case life-cycle *</td>
<td>56</td>
<td>41</td>
<td>-27%</td>
</tr>
</tbody>
</table>

* Pre-trial phase to be further improved by implementing DDP control
A Magistrate Court in Israel – Complete Kit pilot in Road Accident Victim Compensation cases:

<table>
<thead>
<tr>
<th>Year</th>
<th>RAVC Throughput (no. of cases)</th>
<th>Torts Throughput (no. of cases)</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>3548</td>
<td>4470</td>
<td>7.2</td>
</tr>
<tr>
<td>2011</td>
<td>4476</td>
<td>5733</td>
<td>6.0</td>
</tr>
<tr>
<td>% change</td>
<td>+26%</td>
<td>+28%</td>
<td>-17%</td>
</tr>
</tbody>
</table>

Total T increase 43%
The implementation process

• Steering committee headed by the Chief Justice and the manager of the courts system

• seminars to 96 presidents and vice presidents of courts on TOC and Focused Management
The implementation process

- **Pilot implementation in 4 courts**
  - Steering committee headed by the president of the court
  - Focusing on few improvement topics
  - Seminars for judges, legal aides and administration
  - Meetings with the Bar Association, the District Attorney, and the Public Defender
  - Value-enhancement teams
  - Flexibility in the implementation: adaption of the solution to the special needs, culture and characteristics of each court
  - Measurements and control
• Most service processes comprise of 2 stages:
  - Stage 1: requires fast response and small efforts, and solves or screens most of the cases (20/80)
  - Stage 2: treatment by professionals, small amount of cases that require most of the effort (80/20)

• Examples
  - Hospitals
  - Maintenance depots and help desks

• Stage 1: protective capacity
• Stage 2: DBR
• Unified system: dDBR
Conflict resolution by a win-win solution:
- **At the first treatment stage** – use fast initial response and stabilizing patients (ER)
- **At the second treatment stage** – use DBR for efficiency and effectiveness (hospitalization in wards)

**Main problem in hospitals – lack of synchronization**
Introducing **due-date performance** measurements for the pre-trial phase should result in Lead Time reduction, and

- Continuations reduction
- Taking advantage of “the student effect” and “Parkinson effect”
PM and CCPM implementation in “Mega” cases
Thank you!