SCIRA: A Risk System Management Tool

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Bottom line:

1. Role coupling and complexity plays in errors and system resilience.
2. SCIRA as a tool to measure system resiliency.
3. Recognize leverage points for improving system resilience and organizational performance.
Agenda

- SCIRA worksheets
- Systems for organizing risk planning
- Coupling and Complexity
- SCIRA as a risk system management tool

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SCIRA worksheets

- 5 minutes to fill in worksheets
- Score 1-5 on each
- **Goal**: familiarize
  *(accuracy secondary)*

*Full article and index factor interpretation:*
[www.riskmanagementconsulting.ca](http://www.riskmanagementconsulting.ca)
Seven Systems of Risk Management Planning

- Business Management System
- Organization Planning System
- Program Planning System
- Client Information System
- Equipment Management System
- Crisis Management System
- Staffing/Human Resources System

Managing Risk
Systems Planning for Outdoor Adventure Programs

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Systems Organizing Risk Planning

Trigger/event based:
- Field based
- History / experience based

System based:
- Top down / bottom up
- Risk tolerance based
Systems Organizing Risk Planning

Scope and language:

**System:** an organized and highly integrated arrangement of parts operating towards a specific goal.

**Risk management** is a systems based approach to sustainably managing uncertainty within an operating environment.
Measuring System Resiliency: Error Management:

Active errors:
- Guide slips, lapses, mistakes
- ‘sharp end’
- Focus of trigger/event based RM

Latent errors:
- Dormant, long term conditions
- ‘blunt end’
- Focus of systems based RM
Measuring System Resiliency:
Latent / System errors

“Be suspicious of operator error…” as it is often the easy target in an unclear scenario

60-80% of system errors are blamed on the operator (Perrow, 1990)

“…latent errors pose the greatest threat to the safety of a complex system.” (Reason, 1990)
# Measuring System Resiliency: Coupling (Cp) / Complexity

<table>
<thead>
<tr>
<th>Loosely Coupled</th>
<th>Tightly Coupled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slack: time, resources, options</td>
<td>No slack</td>
</tr>
<tr>
<td>Time between decisions</td>
<td>No time, rapid succession</td>
</tr>
<tr>
<td>Time to correct</td>
<td>No time to correct</td>
</tr>
<tr>
<td>Many options per decision</td>
<td>Few options</td>
</tr>
<tr>
<td>Flatwater paddling</td>
<td>Continuous class V</td>
</tr>
</tbody>
</table>

## Operational Coupling:
= Fast paced, high volume, tightly managed
# Measuring System Resiliency: Coupling / Complexity (Cx)

<table>
<thead>
<tr>
<th>Linear system</th>
<th>Complex system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to explain</td>
<td>Detailed, complicated</td>
</tr>
<tr>
<td>Single goal or process</td>
<td>Multiple goals, processes</td>
</tr>
<tr>
<td>Predictable outcome, even if unplanned</td>
<td>Unanticipated interactions when sequence fails</td>
</tr>
<tr>
<td>Failure can be isolated</td>
<td>Failure compounding</td>
</tr>
<tr>
<td>Climbing bolted 5.6 route</td>
<td>Exploratory first ascent of remote mountain range</td>
</tr>
<tr>
<td>Owner/operator canoe trip company</td>
<td>Large scale international adventure company</td>
</tr>
</tbody>
</table>

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Measuring System Resiliency: Failure Detection (fD)

- Experience under stress = ability to recognize failure

- *Failure detection does not directly prevent accidents or injuries*
SCIRA

- Quantifies system complexity
- Indicator of system failure potential

\[ \text{coupling} + \text{complexity} = \text{risk of failure} \] (Perrow, 1990)

*NOT a measure of system efficacy!!*
SCIRA values

$C_p \times C_x \times fD$

$C_p = \text{coupling (↓)}$

$C_x = \text{complexity (↔)}$

$fD = \text{failure detection (↓)}$

$\text{SCIRA} = (C_p) \times 2(C_x) \times 0.6(fD)$
SCIRA values

• Samples from delegates
SCIRA can:

1. Assess system complexity and system failure potential.
2. Target system improvements and models system change.
3. Benchmark system complexity against other programs or operations.
Leverage points:

• Start here for system improvements
  – Research based

• Minimize ‘5’ scores:
  – is it fixed or open to change?
To do list / key learning

1. Cp: align w risk tolerance
   purposeful slack

2. Cx: recognize complexity (creep)
   manage efficiency v. complexity

3. fD: red flag
   test, train, info share
Bottom line:

1. Role coupling and complexity plays in errors and system resilience.
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3. Recognize leverage points for improving system resilience and organizational performance.
References / further reading


Managing Risk
Systems Planning for Outdoor Adventure Programs

Available Jan. 2010
www.riskmanagementconsulting.ca

Jeff Jackson
Jon Heshka
Matt Cruchet