SCIRA: A Risk System Management Tool

Author: Jeff Jackson jeff.jackson@algonquincollege.com

TERMS OF USE

These worksheets represent research undertaken during the writing of Managing Risk: Systems Planning for Outdoor Adventure Leadership (2010) published by Direct Bearing Inc. and is specifically and exclusively being made available to:

Delegates of the Wilderness Risk Management Conference, 2009.

These worksheets and the supporting paper may be used for research and private study purposes. Any reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone must be approved by the author (contact information below).

The full paper may be found online at www.riskmanagementconsulting.ca

The author does not give any warranty express or implied or make any representation that the contents will be complete or up to date. The author shall not be liable for any loss, actions, proceedings, demand or cost or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

SCIRA = (Cp) x 2(Cx) x 0.6(fD) (see footnote[1])

Key point on interpreting results:

Cp1 need be aligned with organizational risk tolerance.

Cp lower is better; implement purposeful slack into system or program.

Cx need be recognized and managed; lower values are desirable but operational requirements in some ways fixed.

fD lower is better; test and train to minimize exposure.

Use SCIRA to model system change and as leverage points to build system resiliency.

[1] Author's research indicates fD, the potential for detecting failure, has less impact on latent system errors than both coupling and complexity, although its presence (or a low index score) minimizes both coupling and complexity. Its leverage points are also valuable from a management perspective. Lower fD index values are often tied to organizations with higher Cx index values, necessitated by more complex organizational models.

INDEX 1:

COUPLING INDEX (Cp)	Loosely coupled (1)	Moderately coupled (3)	Tightly coupled (5)	Approximate INDEX RATING (1-5)
Possible model operations	The Nature Guiding Company	The Skill Instruction Program	"Extreme" Adventure Guiding	N/A
Cp1: Typical activities	Soft adventure, low speed activities: snowshoeing, flatwater canoeing; international travel	Activities in need of management to limit exposure: open water sea kayaking; mountain biking; rock climbing; groomed skiing; off trail travel	High exposure activities: high grade whitewater rafting; scuba diving; mountaineering; adventure racing; motor sports	
Cp2: Time restraints	Flexibility in itinerary or timeline	Itinerary actively managed; can be adjusted by altering plan	Itinerary dictated by environment: difficulty of terrain, weather window, access options; delays create additional exposure	
Cp3: Client focus	Program designed around known client needs, and is adaptable to changing client needs	Clients matched to appropriate program demands; responsive to needs given base level skill and ability	Little to no adaptation possible, environment dictates needs	
Cp4: Human resources: Field staff	Qualified staff readily available (based on technical skill)	Experienced staff with specific skill set	Specialty staff with intimate knowledge of environment, few in number	
Cp5: Volume / delivery pressure	Low volume operation; program logistically independent	Concurrent programs with minimal overlap or logistical link	High volume operation or tightly linked logistics	
Cp6: Equipment and technology	Little reliance on equipment or technology	Specific equipment and technology expected but can be improvised	Specific, critical equipment and technology vital to safety	
			TOTAL COLUMN; Divide by 6 for COUPLING RATING (Cp)	

INDEX 2:

COMPLEXITY INDEX (Cx)	Linear operation (1)	Hybrid operation (3)	Complex operation (5)	Approximate INDEX RATING (1-5)
Possible model operations	Ski school; canoe tripping company	Adventure resort; high school outdoor education semester; summer camp	International adventure travel company; university outdoor degree program; large scale expedition company	N/A
Cx1: Ease of understanding operation/ Cognitive complexity	Simple, visible program, easy to explain to potential participants	Program with multiple options or offerings, explanation raises questions requiring detailed answers	Multiple logistically complex programs with different goals and performance requirements; defies simple explanation	
Cx2: Operational consistency	Standard trip or program repeated exclusively	Variety of offerings or variations available within standard offering	Programs or services continually added, removed, modified or customized	
Cx3: System age / latency period	Operation has had little need for evolution from inception	Operation experienced growth and development from original concept, but stabilized at a working model	Operation experienced significant growth and development from original concept, continuing developmental process	
Cx4: Human Resources: Supervisory and management	Owner/operator directly involved in delivery of program or service	Top management have been involved for significant portion of operation's history; management removed from daily operations; hand full of managers oversee whole operation	Notable turnover among middle and top management; removed from daily operations; possible multiple levels of management oversee different aspects of operation	
Cx5: Capacity utilization (average)	Consistently operates at less than 60% capacity	Consistently operates at 60-90% of capacity	Consistently operates above 90% capacity	
			TOTAL COLUMN; Divide by 5 for COMPLEXITY RATING (Cx)	

INDEX 3:

FAILURE DETECTION INDEX (fD)	Detection Likely: (1) History of system failure/system accident	Detection Potential: (3) Experience at peak capacity/peak load	Detection Difficult: (5) No history in recognizing system failure	Approximate INDEX RATING (1-5)
fD1: System failure or critical incident experience	Operation has experienced several different types and scales or failures or critical incidents	Operation has experience with a particular type or scale of failure or incident	Operation has never had to deal with system failure or critical incident	
fD2: Capacity utilization (peak load experience)	100% or greater on a regular basis (i.e. every weekend)	100% on specific occasions; predictable and planned (i.e. key holiday weekends)	Rarely exceeds 80%; have not had to operate under peak load	
fD3: Product quality control	Every program or product is measured for *accuracy* against strict and objective standards	Product sample or average measured for *reliability/consistency* within wide parameters of quality	Quality not defined or is based on client satisfaction; *reliability/consistency* not measured	
fD4: Incident reporting; Information sharing	Rigorous multi-level reporting system in place, information pushed to all levels of organization	Field based reporting system; information deemed relevant passed to certain organization levels	No formal reporting system, relies on word of mouth information sharing	
fD5: Contracted service reliance	Isolated use of contracted service providers, typically on non-delivery related functions (or no use = 0)	Limited use of contracted service providers for delivery and non-delivery functions	Extensive use of contracted service providers to deliver core program or service; variety of providers	
fD6: Cost control	Operational costs are tracked per program or monthly and compared program-over-program and year-over-year	Operational costs are tracked but viewed independent from operations and risk control	Costs not tracked	
			TOTAL COLUMN; Divide by 6 for FAILURE DETECTION RATING (fD)	