

ONTOLOGY-BASED EVALUATION OF NATURAL DISASTER MANAGEMENT WEBSITES: A MULTISTAKEHOLDER PERSPECTIVE

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Appendix A

Review of Research on Disaster Management Frameworks

Study	Event	Stages of Management	Major Outcomes
Bakir (2004)	Natural	Preparedness, planning, response, recovery	Proposed national mitigation strategies for earthquake risk reduction in Turkey from legislative, economic, and technical aspects. The strategies were targeted to different time frames of 1-10 years.
Bui et al. (2000)	Natural, man-made	Pre-crisis, crisis, post-crisis	Proposed a framework for designing a Global Information Network (GIN) for humanitarian assistance and disaster relief operation. Components of the GIN were identified based on three crisis stages.
Faulkner (2001)	Natural, man-made	Pre-event, prodromal, emergency, intermediate, long term (recovery), resolution	Using prior studies, proposed a tourism disaster management framework consisting of disaster management responses and strategies in six stages.
Fink (1986)	Crisis	Prodromal, acute, chronic, resolution	Proposed a four-phase framework for crisis management.
Henderson (2004)	Natural, man-made	Mitigation, preparedness, response, recovery	Identified contributors to the pervasive risk of man-made and natural disasters in developing nations: poverty and poor health care of population, aging physical infrastructures, underfinanced public bureaucracies, and incapacitated emergency response infrastructure.
Hensgen et al. (2003)	Crisis	Signal detection, preparation, containment, recovery, learning	Added chaos and stress into the five-phase crisis management framework proposed by Mitroff (1988). Suggested added emphasis on signal detection.

Study	Event	Stages of Management	Major Outcomes
Hwacha (2005)	Natural, man-made	Mitigation, preparedness, response, recovery	Proposed disaster mitigation strategies to guide future development and implementation of Canada's national disaster strategies.
Jayaraman et al. (1997)	Natural	Mitigation, preparedness, response, recovery/relief	Highlighted the role of communication satellites in assisting disaster management based on information requirements of various types of disasters.
Lettieri et al. (2009)	General	Strategy, mitigation, preparedness, response, signaling, recovery, learning	Reviewed the disaster management research between 1980 and 2006 and found more focus on strategy and response phases in this research.
Mileti (1999)	Natural	Mitigation, preparedness, response, recovery	Proposed a four-phase model for natural disaster management.
Moe and Pathranarakul (2006)	Natural	Prediction, warning, emergency relief, rehabilitation, reconstruction	Suggested proactive and reactive strategies for different phases of disaster management.
O'Brien et al. (2010)	Natural	Mitigation, preparedness, response, recovery	Argued that the emphasis of natural disaster management should be on the preparedness phase.
Pearson and Mitroff (1993)	Crisis	Signal detection, preparation, containment, recovery, learning	Proposed a five-phase framework for crisis management.
Perry (2007)	Natural	Preparedness, response, aftermath	Summarized findings from pre- and post-tsunami research and proposed a holistic planning model to cover the activities in three phases of disaster management. The model was qualitatively tested through interviews with managers of tsunami-response logistics. The findings identified a lack of preparedness.
Racherla and Hu (2009)	Natural, man-made	Pre-event, prodromal, emergency, intermediate, long term, resolution, feedback	Proposed a knowledge-based crisis management framework with six phases for the hospitality and tourism industry.
Roberts (1994)	Flood	Pre-event, emergency, intermediate, long-term	Identified important tasks and functions for flood management in four phases.
Shaluf (2008)	Technological	Pre-disaster, during disaster, post-disaster	Provided an overview of technological disasters in three overlapping phases.

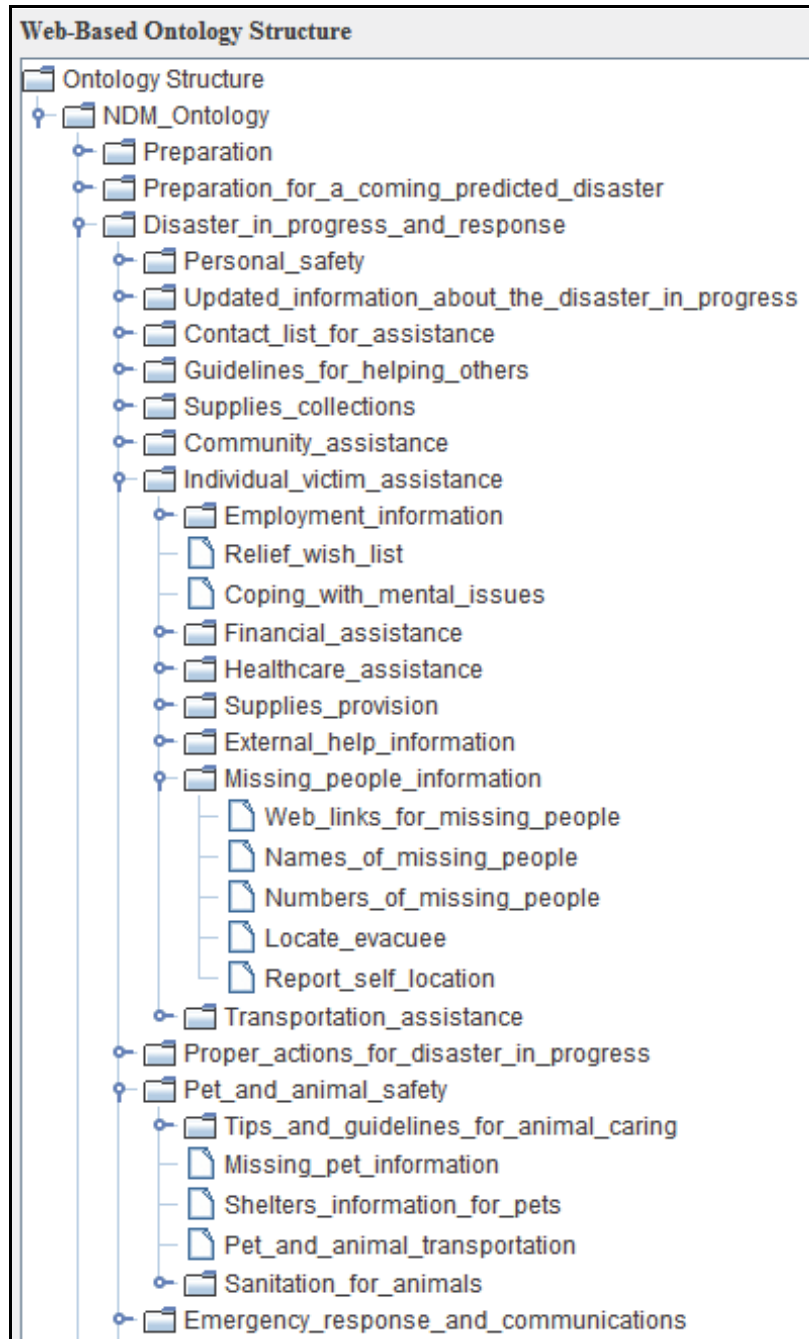
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Appendix B

Partial Snapshot of the Ontology Browser Provided to the Experts in the Delphi Study



Appendix C

Identification Process and Geographical Distribution of the Experts in the Delphi Study

In order to validate and rate the elements of our developed ontology structure, we needed to assemble experts in the domain of natural disaster management from all regions of the United States. Our goal was to have a good geographic coverage of experts in the 50 U.S. states. We made every effort to have a large pool from the 50 states in order to achieve adequate geographical coverage. That is, a total of 50 respondents, one from each state, would give us full geographic coverage of the 50 states, while a total of 50 respondents from one state would be very poor geographic coverage.

State government officers who worked in the department of disaster/emergency management were considered potential experts knowledgeable in this domain. Based on a list of 50 official state emergency/disaster management websites, we identified over 1,500 potential experts who were working for state governments in the United States. The contact data were assembled from the websites listed in Appendix H. The data were located on various pages on the websites, including About Us, Contact Us, Functional Divisions, Organization Charts, and Staff List, or by a search in the database of the state government. We further screened the pool of potential participants based on their functions and job titles that could be potentially related to the domain of disaster management. For example, those who were responsible for financial analysis, accounting, law enforcement, and so on were excluded from the pool. We kept contact data for those whose job titles were, for example, director of emergency management agency, director of functional divisions such as preparedness, training, planning, response, recovery, and mitigation. The final pool consisted of 1,485 names of individuals whose jobs and expertise could be potentially suitable for our purpose.

Letters for invitation for expert participation were sent to the pool. After three weeks, 718 reminder e-mails were sent to potential experts for whom we had identifiable e-mail addresses. We received 73 responses from experts whose jobs were related to disaster management and who were willing to serve as experts in our Delphi process. This gave us 100% coverage of four regions (north, south, east, and west), 100% coverage of divisions (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific), and 78% coverage of states. Appendix D provides a map of regions and divisions.

In Round 2, only those who needed to provide further updates provided second responses, which included 29 experts from 18 states. For the subsequent analysis, we cleansed the data by removing ratings of experts whose responses were all 10, which indicated a lack of attention and commitment to the study. The final pool consisted of 61 experts in Round 1 and 29 in Round 2, all of whom were active in managing websites of 31 states, providing us with 100% region and division coverage and 62% of states.

In this appendix, Table C1 provides the details of expert coverage in regions, divisions, and states in Rounds 1 and 2. Table C2 lists the job titles of the experts who participated in the Delphi process. The job titles varied from state to state, since the administration structures in relation to NDM websites vary across states. However, the reported job titles reflect the salient authority of the experts who participated in the Delphi study.

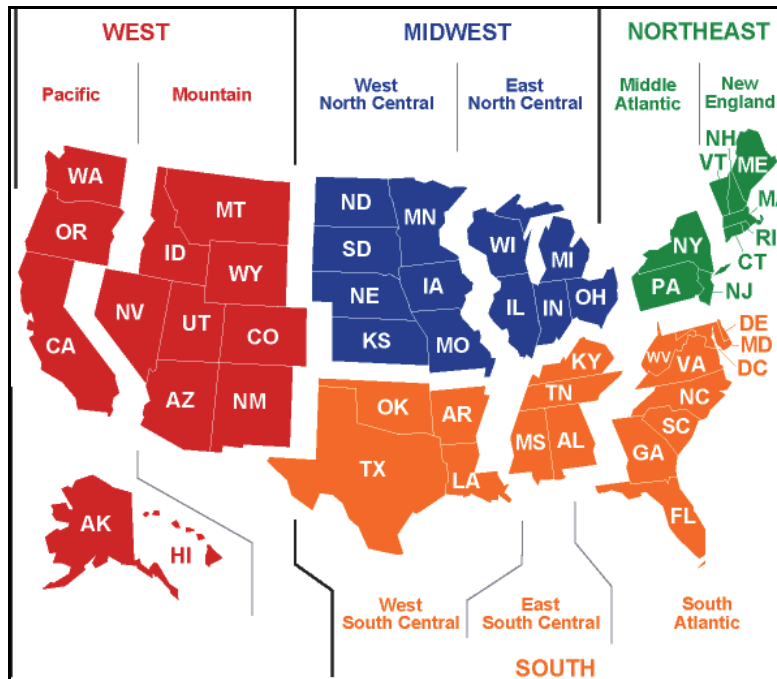
Table C1. Geographical Distributions of Participating Experts in the Delphi Study				
Region	Division	State	Number of Experts	
			Round 1	Round 2
Northeast	New England	Connecticut	0	0
		Maine	2	1
		Massachusetts	1	0
		New Hampshire	2	1
		Rhode Island	0	0
		Vermont	1	1
	Middle Atlantic	New Jersey	0	0
		New York	5	3
		Pennsylvania	1	1
Midwest	East North Central	Indiana	1	1
		Illinois	0	0
		Michigan	0	0
		Ohio	2	0
		Wisconsin	3	0
	West North Central	Iowa	1	0
		Kansas	1	1
		Minnesota	4	3
		Missouri	1	0
		Nebraska	2	0
		North Dakota	3	2
		South Dakota	0	0
South	South Atlantic	Delaware	1	1
		Florida	3	2
		Georgia	0	0
		Maryland	0	0
		North Carolina	1	0
		South Carolina	3	2
		Virginia	5	3
		West Virginia	2	2
	East South Central	Alabama	0	0
		Kentucky	0	0
		Mississippi	1	0
		Tennessee	1	0
West South Central	Arkansas	1	0	
	Louisiana	0	0	
	Oklahoma	0	0	
	Texas	0	0	
West	Mountain	Arizona	0	0
		Colorado	0	0
		Idaho	1	1
		New Mexico	4	1
		Montana	2	0
		Utah	0	0
		Nevada	1	1
		Wyoming	0	0
	Pacific	Alaska	1	0
		California	0	0
		Hawaii	0	0
		Oregon	2	1
		Washington	2	1
Total			61	29

Table C2. Job Titles of the Experts in the Delphi Study	
Job Title	Number of Experts
Assistant Director/Community Affairs	1
Budget Analyst	1
Bureau Chief	1
Chief of IFLOWS Branch	1
Chief of Preparedness	1
Communication Specialist III	1
Community Response Coordinator	1
Coordinator	1
Critical Infrastructure Protection Officer	1
CSEPP Training / Exercise	1
Deputy Director for Preparedness and Planning	2
Deputy State Coordinating Officer-Public Assistance	1
Director Operations and Training	2
Disaster Assistance Program Manager	1
Disaster Recovery Chief	1
Disaster Response and Recovery Planner	1
Emergency Services Manager	2
Hazard Mitigation Projects	1
Hurricane Program Manager	1
Individual Assistance Officer	1
Logistics Chief	1
Logistics Manager/Medical Specialist	1
Management Analyst Supervisor	1
Manager Natural Hazards Plans	1
Mitigation Officer	1
Mitigation Planner/ICS Plans Section	1
Natural Hazards Planning Unit Manager	1
Operations Management/Planning Officer	3
Planner IV Natural Hazards Section	1
Planner VDEM Region VII	1
Planning & Research Assistant	1
Planning Specialist	1
Planning Specialist / Disaster Response Team	1
Plans, Training and Exercise Coordinator	1
Pre-Disaster Mitigation Program Coordinator	1
Preparedness Bureau Chief	1
Public Assistance Chair	1
Public Assistance Coordinator	1
Public Assistance Reviewer	1
Public Education	1
Public Information Officer	4
Regional Program Coordinator/Planner	3
Response, Recovery & Mitigation Branch Director	1
Senior Field Representative	1
State Hazard Mitigation Officer	1
State Public Assistance Officer	1
State Training Officer/Manager	2
Terrorism Exercise Training Coordinator	1
Training Coordinator/Recovery Specialist	1
Web Coordinator	1

Appendix D

The Regions and Divisions of the States in the United States

The U.S. Census Bureau groups the 50 states into 9 divisions and the 9 divisions further into 4 regions.



Source: http://www.eia.doe.gov/emeu/rep/maps/us_census.html

Appendix E

Validated Ontology and Importance Ratings

For the expert rating, we used the final rating of each expert for each element. If an expert made changes in the second round of the Delphi study, we used the new ratings. Otherwise, the ratings from the first round were deemed final. For the newly added elements, we used the available ratings (i.e., those from the second round). Table E1 reports elements at levels 2–4. With the single element at level 1, the validated ontology has 209 elements on its 1–4 levels.

Table E1. Validated Ontology and Overall Average Ratings by Experts and Potential Users

Element	Expert Rating	User Rating
I. Preparation	8.60	8.20
1. Disaster information and history	7.11	7.32
Damage history	7.00	6.87
Disaster information	7.70	7.97
Presidential disaster declaration	7.75	6.72
State disaster declaration	7.54	7.19
2. Individual and family preparation	8.64	8.70
Protection plans	7.95	8.56
Evacuation plans	8.48	8.84
Building, shelter, & personal security plans	7.85	8.58
Individual supplies kit preparation	8.33	8.47
Individual emergency exercises	7.35	7.79
Individual emergency training	7.22	7.76
Facts about individual and family disaster preparation	7.44	7.73
Emergency preparedness checklist	8.38	8.05
Goals of individual and family preparation	7.43	7.55
Creation of personal support network	7.55	7.28
3. Business preparation	8.09	6.97
Emergency contact list creation	8.17	7.85
Emergency plans in workplace	8.59	8.24
Business emergency plans exercises	8.33	7.72
Business emergency supplies preparation	8.05	7.92
Continuity of operations	9.00	7.56
4. Public and community preparation	8.69	7.94
Public emergency exercises	7.72	7.56
Community plans	8.31	7.88
Community preparation	8.28	7.99
Planning assistance	7.84	7.62
State mitigation planning	8.16	7.39
State comprehensive emergency management plan	8.87	7.65
Statewide mutual aid compact	8.21	7.41
Public evacuation plan	8.23	8.51
State preparedness report	6.87	7.42
Threat assessment	10.00	7.99
Continuity of government plan	10.00	7.69
5. Signals and warnings	8.42	8.91
Warning method	8.20	8.83
System availability in local place	8.13	8.65
Warning systems	8.36	8.90
Warning advisory	7.93	8.77
Current weather condition	7.77	8.41
Homeland security threat level	5.20	7.71
School closing information	7.38	7.95
Up-to-date information and news	8.46	8.89

Table E1. Validated Ontology and Overall Average Ratings by Experts and Potential Users (Continued)

Element	Expert Rating	User Rating
└ 6. Emergency contacts	8.57	8.62
└└ State emergency contacts	8.38	7.89
└└└ County and city emergency contacts	9.03	8.40
└ 7. Training	8.44	7.66
└└ Training for preparation	8.02	7.63
└└ Training for specific disaster	7.36	7.73
└└ Training for emergency response	8.37	8.01
└└ Training for recovery	7.93	7.67
└└ Calendar of training activities	7.82	7.03
└└ Certificate of training	6.44	6.26
└└└ Officials needed to be trained	8.47	7.95
└ 8. Goals and facts about the preparation	7.48	7.43
└ II. Preparation for a coming/predicted disaster	8.90	8.75
└└ 1. Information for the coming disaster	8.66	8.92
└└└ Up-to-date information for the disaster	9.03	9.03
└└└ Emergency contact list	8.64	8.49
└└└ Disaster advisory	8.23	8.63
└└ 2. Information specific about a disaster	8.49	8.47
└└└ Tornado preparation	7.68	8.84
└└└ Hurricane preparation	5.85	7.55
└└└ Tsunami preparation	4.30	6.90
└└└ Flood preparation	8.66	8.33
└└└ Volcano preparation	3.55	5.98
└└└ Winter storm preparation	7.85	7.77
└└└ Thunderstorm and lightning preparation	7.67	7.28
└└└ Wildfire preparation	7.37	6.94
└└└ Extreme heat preparation	7.16	6.90
└└└ Heat wave preparation	6.77	6.76
└└└ Drought preparation	6.89	6.55
└└└ Hail preparation	6.28	6.55
└└└ Landslide preparation	5.65	6.14
└└└ Earthquake preparation	7.21	7.31
└└ 3. Goals and facts of preparation for coming disaster	8.08	8.36
└ III. Disaster in progress and response	8.52	8.91
└└ 1. Personal safety	9.10	8.99
└└└ Shelter-in-place	8.57	8.96
└└└ Evacuation	8.49	9.06
└└└ Self-health caring	8.11	8.71
└└ 2. Updated information about the disaster in progress	8.92	8.92
└└└ Broadcasting methods of information update	8.80	8.88
└└└ Weather information and forecasts	8.62	8.85
└└└ Transportation	8.26	8.46

Table E1. Validated Ontology and Overall Average Ratings by Experts and Potential Users (Continued)

Element	Expert Rating	User Rating
3. Contact list for assistance	8.58	8.39
└ Non-profit organization emergency numbers	7.70	7.62
└ Governmental emergency numbers	8.57	8.07
└ Hot lines	8.51	7.97
└ Contacts for individual assistance	8.15	8.37
└ Contacts for community assistance	8.20	8.10
4. Guidelines for helping others	7.65	8.13
└ Tips and guidelines for helping others	7.78	8.01
└ Helping others with disability and special needs	8.49	8.27
5. Supplies collections	7.83	8.24
└ Supplies management	8.30	8.11
└ Available supplies from different sources	8.15	8.32
└ Donations	7.60	7.76
└ Volunteers	8.36	8.07
6. Community assistance	8.00	8.18
└ Virtual community set-up for information exchange	7.13	7.70
└ Online communications	7.37	7.83
└ List of community needs	7.83	7.77
7. Individual victim assistance	8.38	8.44
└ Employment information	6.72	6.89
└ Relief wish list	6.38	7.03
└ Coping with mental issues	7.41	7.13
└ Financial assistance	7.93	7.80
└ Healthcare assistance	8.43	8.36
└ Supplies (shelters, food, clothes) provision	8.42	8.69
└ External help information	7.79	7.65
└ Missing people information	8.43	8.75
└ Transportation	7.98	8.21
8. Proper actions for disaster in progress	8.44	8.60
└ Proper actions in specific situations in specific disaster	8.27	8.44
└ Proper actions for the specific disaster	8.40	8.53
9. Pet and animal safety	7.30	7.27
└ Tips and guidelines for animal caring	7.18	6.94
└ Missing pet information	6.55	7.04
└ Shelters information for pets	7.32	7.03
└ Pet and animal transportation	6.79	6.61
└ Sanitation for animals	7.10	6.73
10. Emergency response and communications	9.20	8.67
└ Communication resources	8.77	8.34
└ Communication systems	8.79	8.41
└ Communications capabilities	8.77	8.32
└ Communications interoperability	10.00	8.13

Table E1. Validated Ontology and Overall Average Ratings by Experts and Potential Users (Continued)

Element	Expert Rating	User Rating
└11. State government responses	8.84	8.12
└Alerts and notifications	8.70	8.66
└Activation of the state emergency operations center	8.85	8.42
└Coordination of emergency support functions	8.93	8.35
└Priorities for allocating resources	8.77	8.15
└State emergency response team	8.15	8.32
└Mobile operations center	7.76	8.27
└Disaster reconnaissance team	8.02	8.19
└Governmental communications	8.82	8.03
└State warning point section	8.54	8.04
└ Public affairs	9.00	7.33
└12. Federal government responses	8.13	7.88
└Mobile telecommunications	7.82	8.20
└Operational support	8.08	8.03
└Life support	8.02	8.44
└Power generation assets	8.08	8.31
└Medical responses	8.47	8.71
└Assistance for urban search and rescue	8.16	8.40
└Coordination with state, local and tribal governments and the private sector	8.79	8.24
└13. Mobile emergency response	8.47	8.48
└14. Response mission	8.55	7.77
└IV. Disaster recovery	8.79	8.60
└1. Recovery mission	8.41	8.23
└Cleaning up	8.48	8.71
└Rebuilding	8.41	8.59
└2. Immediate recovery	8.69	8.84
└Up-to-date information about immediate recovery	8.36	8.77
└Personal safety assurance	8.30	8.74
└Transportation from temporary shelter	7.42	8.33
└Animal care	7.00	6.98
└Family member lookup	8.59	9.01
└Supplies collections and delivery (including food)	8.61	8.84
└Proper self actions after disasters	8.10	8.46
└Helping others	8.12	8.58
└3. Short-term recovery	8.84	8.71
└Informational needs during recovery	8.61	8.45
└Recovery for victims (including finance & medical)	8.70	8.77
└Recovery for environment	7.33	7.75
└Recovery for property	7.70	8.06
└Recovery for communities	8.30	8.01
└Assistance for recovery	8.57	8.37
└Mobile emergency	7.22	8.42
└Social support	7.69	7.71

Table E1. Validated Ontology and Overall Average Ratings by Experts and Potential Users (Continued)

Element	Expert Rating	User Rating
└ 4. Long-term recovery	8.67	8.37
└└ Informational needs for long-term recovery	8.48	8.32
└└ Monitoring victims' health	7.77	8.30
└└ Monitoring communities' recovery	8.00	8.05
└ V. Learning and mitigation	8.54	7.91
└ 1. Best practices and case studies	8.07	7.62
└└ Best practices available	8.21	8.03
└└ Case studies and examples	7.93	7.64
└ 2. Damage report and news	7.84	8.03
└└ News archives	6.90	7.42
└└ Damage reports	7.93	7.92
└└ Impact and damage assessment	8.23	8.06
└ 3. Lessons learned	8.52	7.90
└└ Areas for improvement	8.59	8.20
└└ What went right	8.11	8.09
└└ What went wrong	8.38	8.34
└└ Recommendation for the future	8.54	8.50
└ 4. Plans for future changes	8.21	8.18
└└ Must have plans	8.53	8.60
└└ Best have plans	7.68	8.22
└ 5. Recognition of heroes	6.49	7.08
└└ Stories about the heroes	6.10	6.98
└└ Photos of the heroes	5.72	6.54
└└ Credits to the heroes	6.08	6.89
└└ Types of heroes	5.15	6.32
└ 6. Efforts/contributions made by institutions	6.82	6.97
└└ Events involved	6.87	7.00
└└ Donations made	7.00	6.98
└└ Efforts made	7.28	7.32
└ 7. Disaster loss-reduction programs	7.90	7.66
└└ Hazard mitigation grant program	8.07	7.64
└└ Pre-disaster mitigation competitive grant program	7.75	7.43
└└ National flood insurance program	8.23	7.55
└└ Flood mitigation assistance program	8.20	7.56
└└ <i>Repetitive flood claims program</i>	9.00	7.34
└└ <i>Severe repetitive loss program</i>	9.50	7.41
└└ <i>Residential construction mitigation program</i>	9.00	7.66

*Italic entries indicate newly suggested elements through the Delphi study.

**Boldface entries indicate modifications through the Delphi study.

Table E2. Regional Average Ratings of Disaster-type-specific Elements by Experts and Potential Users

Element	Expert				User			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West
Tornado preparation	6.67	8.72	8.25	6.38	8.55	8.87	8.99	8.00
Hurricane preparation	8.18	3.50	8.17	3.92	8.27	7.04	9.09	8.27
Tsunami preparation	3.67	2.94	5.11	5.62	7.02	6.61	7.69	7.45
Flood preparation	9.50	8.44	8.44	8.46	8.29	8.23	8.72	8.24
Volcano preparation	2.33	2.83	3.00	6.42	5.31	6.00	5.93	5.88
Winter storm preparation	8.42	8.33	6.83	8.08	7.20	8.04	6.96	7.18
Thunderstorm and lightning preparation	8.08	7.78	7.44	7.46	7.10	7.28	7.25	7.30
Wildfire preparation	6.83	6.67	7.39	8.81	7.18	6.85	7.00	7.30
Extreme heat preparation	6.00	7.47	7.50	7.35	6.61	6.82	7.23	6.70
Heat wave preparation	6.33	7.44	7.06	5.85	6.45	6.68	7.04	6.85
Drought preparation	6.83	7.17	7.28	6.00	6.73	6.37	6.83	7.39
Hail preparation	5.83	6.94	6.06	6.08	6.65	6.57	6.38	5.97
Landslide preparation	5.08	5.22	5.28	7.27	6.35	6.10	5.89	6.48
Earthquake preparation	7.33	7.33	5.80	10.00	7.82	7.02	8.02	8.12

Appendix F

Correlations between States' Annual Weather Events and Expert Ratings of Disaster-Type-Specific Web Elements

Table F1. Correlation Between Winter Storm Preparation and January Minimum Temperature (1951–2009)

Year	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Correlation	-.26*	-.22	-.27*	-.32**	-.24*	-.32**	-.34**	-.32**	-.36**	-.29*	-.38**	-.33**	-.37**	-.32**	-.31**
Year	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Correlation	-.28*	-.28*	-.33**	-.32**	-.38**	-.30**	-.29*	-.29*	-.31**	-.26*	-.31**	-.40**	-.39**	-.36**	-.32**
Year	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Correlation	-.34**	-.31**	-.31**	-.37**	-.38**	-.40**	-.33**	-.37**	-.16	-.23	-.33**	-.26*	-.27*	-.32*	-.34*
Year	96	97	98	99	00	01	02	03	04	05	06	07	08	09	
Correlation	-.33**	-.34**	-.27*	-.27*	-.34**	-.31**	-.30*	-.37**	-.29*	-.27*	-.24*	-.25*	-.31**	-.33**	

***p < 0.01, **p < 0.05, *p < 0.10

Table F2. Correlation Between Extreme Heat Preparation and July Maximum Temperature (1951-2009)

Year	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Correlation	.34**	.22	.37**	.40**	.26*	.41**	.42***	.30**	.21	.33**	.34**	.40**	.37**	.38**	.33**
Year	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Correlation	.38**	.33**	.30*	.41*	.39**	.31**	.37**	.31**	.41**	.35**	.48***	.40**	.36**	.38**	.42***
Year	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Correlation	.36**	.34**	.34**	.34**	.31**	.41**	.39**	.32**	.43***	.37**	.32**	.37**	.28*	.28*	.34**
Year	96	97	98	99	00	01	02	03	04	05	06	07	08	09	
Correlation	.41**	.36**	.39**	.32**	.44***	.42***	.39**	.42***	.40**	.42***	.38**	.39**	.33**	.40**	

Table F3. Correlation Between Flood Preparation and Annual Precipitation (1951-2008)

Year	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Correlation	.31**	.21	.18	.34**	.25*	.21	.10	.27*	.30*	.23	.21	.20	.19	.15	.20
Year	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Correlation	.19	.33**	.24*	.33**	.26*	.14	.32**	.28*	.26*	.27*	.33**	.37**	.23	.23	.22
Year	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Correlation	.36**	.18	.32**	.23	.32**	.38**	.23	.25*	.25*	.31**	.16	.30*	.26*	.25*	.22
Year	96	97	98	99	00	01	02	03	04	05	06	07	08		
Correlation	.29*	.26*	.28*	.25*	.30*	.20	.28*	.28*	.29*	.39**	.33**	.36**	.37**		

Appendix G

User Respondent Profiles

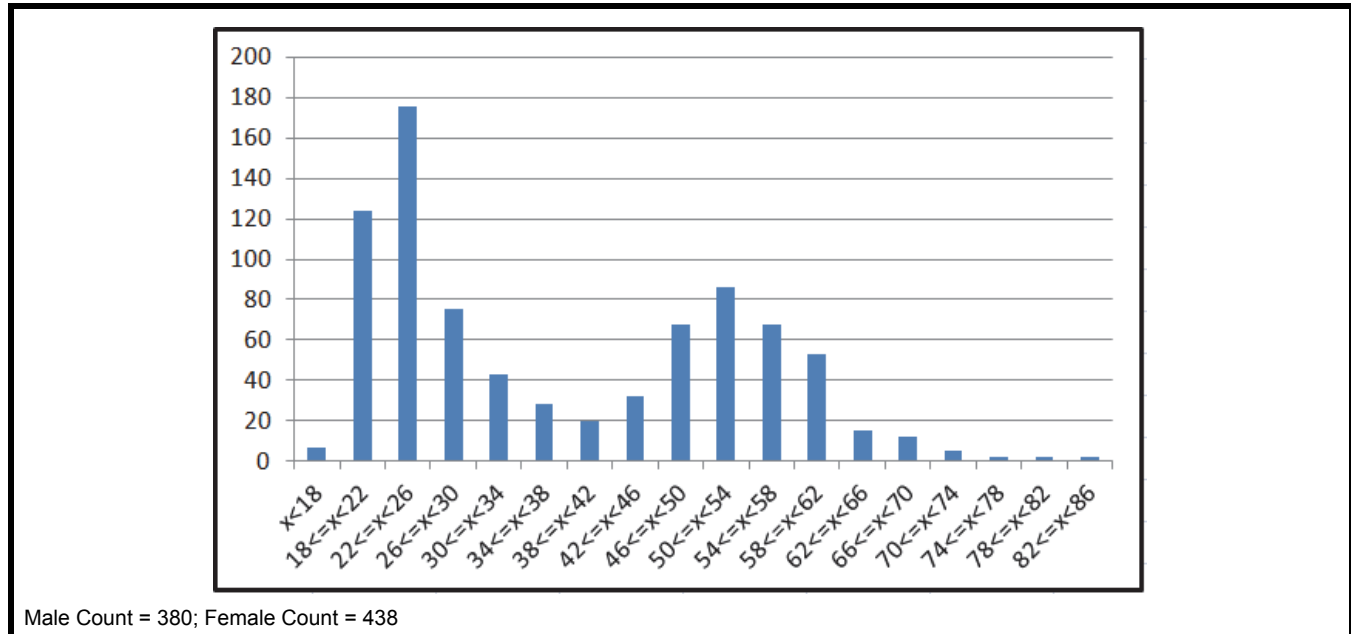


Figure G1. Age Distribution of User Respondents

Table G1. User Respondents' Ratings of Their Own Disaster Experience

Disaster Type	Mean	Std. Deviation
Experience with Tornado	4.64	3.462
Experience with Hurricane	2.96	3.646
Experience with Tsunami	1.40	2.842
Experience with Flood	4.19	3.356
Experience with Volcano	1.29	2.782
Experience with Winter Storm	7.74	2.858
Experience with Thunderstorm and lightning	8.05	2.457
Experience with Wildfire	2.15	3.121
Experience with Extreme heat	5.49	3.364
Experience with Heat wave	5.33	3.425
Experience with Drought	3.86	3.503
Experience with Hail	5.60	2.952
Experience with Landslide	1.55	2.863
Experience with Earthquake	2.18	3.180

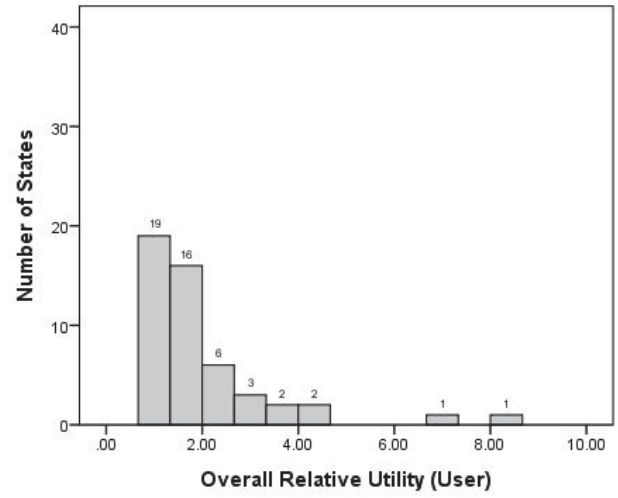
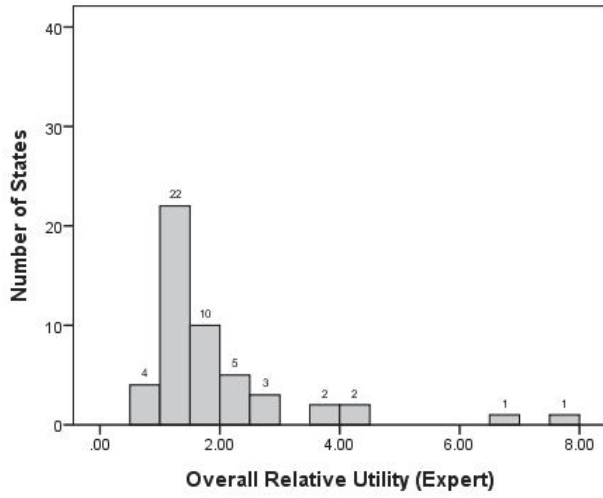
Appendix H

State Government Natural Disaster/Emergency Management Websites

State	URL
Alabama	http://ema.alabama.gov/
Alaska	http://www.ak-prepared.com/
Arizona	http://www.dem.state.az.us/
Arkansas	http://www.adem.arkansas.gov/
California	http://www.oes.ca.gov/
Colorado	http://dola.colorado.gov/dem/index.html
Connecticut	http://www.ct.gov/demhs/site/default.asp
Delaware	http://dema.delaware.gov/
Florida	http://www.floridadisaster.org/
Georgia	http://www.gema.state.ga.us/
Hawaii	http://www.scd.hawaii.gov/
Idaho	http://www.bhs.idaho.gov/
Illinois	http://www.state.il.us/iema
Indiana	http://www.in.gov/dhs/
Iowa	http://www.iowahomelandsecurity.org
Kansas	http://www.kansas.gov/kdem/
Kentucky	http://kyem.ky.gov/
Louisiana	http://www.ohsep.louisiana.gov/
Maine	http://www.maine.gov/mema/
Maryland	http://www.mema.state.md.us/
Massachusetts	http://www.mass.gov/mema/
Michigan	http://www.michigan.gov/emd/
Minnesota	http://www.hsem.state.mn.us/
Mississippi	http://www.msema.org/
Missouri	http://sema.dps.mo.gov/
Montana	http://dma.mt.gov/des/
Nebraska	http://www.nema.ne.gov/
Nevada	http://dem.state.nv.us/
New Hampshire	http://www.nh.gov/safety/divisions/bem/
New Jersey	http://www.state.nj.us/oem/county/
New Mexico	http://www.nmdhsem.org/
New York	http://www.semo.state.ny.us/
North Carolina	http://www.nccrimecontrol.org/Index2.cfm?a=000003,000010
North Dakota	http://www.nd.gov/des/
Ohio	http://ema.ohio.gov/
Oklahoma	http://www.ok.gov/OEM/
Oregon	http://www.oregon.gov/OMD/OEM/index.shtml
Pennsylvania	http://www.pema.state.pa.us/
Rhode Island	http://www.riema.ri.gov/
South Carolina	http://www.scemd.org/
South Dakota	http://www.oem.sd.gov/
Tennessee	http://www.tnema.org/
Texas	http://www.txdps.state.tx.us/dem/
Utah	http://www.des.utah.gov/
Vermont	http://www.dps.state.vt.us/
Virginia	http://www.vdem.state.va.us/
Washington	http://www.emd.wa.gov/
West Virginia	http://www.wvdhsem.gov/
Wisconsin	http://emergencymanagement.wi.gov/
Wyoming	http://wyohomelandsecurity.state.wy.us/

Appendix I

Distributions of Overall Relative Utility Values in 50 States Based on the Ratings by Experts and Users



Appendix J

Relative Utilities of the NDM Websites in the 50 U.S. States

States	Relative Utility (RU)			
	Experts		Users	
	RU	RU Rank	RU	RU Rank
Alabama	1.22	39	1.23	39
Alaska	1.32	33	1.32	33
Arizona	1.43	28	1.44	25
Arkansas	1.67	22	1.62	23
California	1.63	24	1.60	24
Colorado	3.92	6	3.91	5
Connecticut	1.18	41	1.19	40
Delaware	2.89	7	2.89	7
Florida	2.17	11	2.08	13
Georgia	1.85	19	1.80	20
Hawaii	7.77	1	8.01	1
Idaho	2.18	10	2.21	10
Illinois	1.47	25	1.42	28
Indiana	2.06	14	2.02	14
Iowa	1.45	26	1.43	27
Kansas	1.30	38	1.31	36
Kentucky	1.65	23	1.65	22
Louisiana	1.73	21	1.74	21
Maine	4.07	4	4.10	4
Maryland	1.37	32	1.33	32
Massachusetts	2.14	12	2.10	12
Michigan	1.32	33	1.32	33
Minnesota	1.15	43	1.15	43
Mississippi	6.90	2	6.97	2
Missouri	1.40	29	1.41	29
Montana	1.32	33	1.32	33
Nebraska	1.78	20	1.82	19
Nevada	1.32	33	1.30	37
New Hampshire	1.00	46	1.00	46
New Jersey	2.12	13	2.13	11
New Mexico	1.40	29	1.41	29
New York	1.94	16	1.93	17
North Carolina	4.43	3	4.26	3
North Dakota	1.39	31	1.41	29
Ohio	1.32	33	1.28	38

States	Relative Utility (RU)			
	Experts		Users	
	RU	RU Rank	RU	RU Rank
Oklahoma	1.98	15	1.97	16
Oregon	1.90	17	1.91	18
Pennsylvania	2.82	9	2.80	9
Rhode Island	1.19	40	1.17	41
South Carolina	1.03	45	1.03	45
South Dakota	1.10	44	1.10	44
Tennessee	1.45	26	1.44	25
Texas	1.17	42	1.17	41
Utah	0.97	47	0.95	48
Vermont	0.91	49	0.91	49
Virginia	3.95	5	3.87	6
Washington	1.90	17	2.00	15
West Virginia	0.86	50	0.86	50
Wisconsin	2.84	8	2.81	8
Wyoming	0.96	48	0.96	47

*The relative utilities of all states sum to 100.

Appendix K

Comparison of Relative and Absolute Utilities of Websites for Experts and Users

Table K1. Stage 1 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Alabama	1.19	37	1.19	37	23.95	38	23.52	38
Alaska	1.85	25	1.87	24	29.89	25	29.47	25
Arizona	0.86	45	0.81	46	22.24	40	21.39	42
Arkansas	2.07	21	2.09	20	37.16	10	37.13	8
California	2.51	8	2.33	12	37.50	9	36.11	10
Colorado	0.95	44	1.02	43	13.45	49	13.45	49
Connecticut	2.27	18	2.29	17	35.38	13	35.24	13
Delaware	6.57	1	6.81	1	38.53	7	38.87	6
Florida	3.67	4	3.59	4	35.62	12	35.00	14
Georgia	2.36	13	2.32	13	32.13	19	31.50	21
Hawaii	5.36	2	5.58	2	39.65	5	40.09	3
Idaho	1.56	32	1.50	32	18.30	48	18.12	48
Illinois	1.97	23	1.90	23	30.91	23	30.19	23
Indiana	1.65	29	1.47	33	28.82	27	27.44	27
Iowa	0.81	47	0.79	47	21.73	43	21.16	43
Kansas	1.11	41	1.11	41	25.62	35	25.54	35
Kentucky	2.66	7	2.70	7	41.84	2	41.95	2
Louisiana	2.47	9	2.55	8	23.47	39	23.04	39
Maine	2.30	15	2.32	13	32.29	18	32.11	18
Maryland	1.52	33	1.43	34	31.02	22	30.19	23
Massachusetts	1.72	26	1.72	28	28.99	26	28.38	26
Michigan	1.88	24	1.77	25	26.45	32	25.55	34
Minnesota	1.47	34	1.56	31	26.30	34	26.45	32
Mississippi	4.96	3	4.94	3	44.25	1	43.53	1
Missouri	1.01	43	1.02	43	26.74	31	26.53	31
Montana	1.16	38	1.16	39	27.42	28	27.14	28
Nebraska	2.17	19	2.27	19	35.32	14	35.55	12
Nevada	2.29	16	2.30	15	39.86	3	39.76	4
New Hampshire	1.27	36	1.24	36	27.01	30	26.33	33
New Jersey	2.79	6	2.86	6	36.16	11	35.83	11
New Mexico	2.39	12	2.43	11	31.77	20	31.76	19
New York	2.17	19	2.07	21	35.08	15	33.84	15
North Carolina	3.16	5	3.14	5	38.57	6	38.02	7
North Dakota	0.82	46	0.84	45	20.43	44	20.26	44
Ohio	1.62	30	1.61	29	24.80	37	24.80	36
Oklahoma	2.29	16	2.3	15	34.15	16	33.82	16
Oregon	1.70	27	1.73	27	21.98	42	21.74	41
Pennsylvania	2.40	11	2.29	17	37.79	8	36.77	9
Rhode Island	2.06	22	1.99	22	25.28	36	24.72	37

Table K1. Stage 1 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States* (Continued)

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
South Carolina	1.15	40	1.14	40	20.41	45	19.70	46
South Dakota	1.31	35	1.28	35	30.86	24	30.29	22
Tennessee	2.47	9	2.45	9	39.70	4	39.18	5
Texas	0.78	49	0.79	47	18.73	47	18.59	47
Utah	0.80	48	0.76	49	13.39	50	12.99	50
Vermont	0.64	50	0.63	50	20.28	46	19.88	45
Virginia	2.34	14	2.45	9	31.15	21	31.57	20
Washington	1.69	28	1.76	26	22.11	41	22.55	40
West Virginia	1.05	42	1.04	42	27.10	29	26.72	29
Wisconsin	1.58	31	1.61	29	32.99	17	32.82	17
Wyoming	1.16	38	1.18	38	26.43	33	26.64	30

*The relative utilities of all states sum to 100. The absolute utility of each state is between 0 and 100.

Table K2. Stage 2 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Alabama	1.01	25	1.01	25	36.09	22	36.93	20
Alaska	1.14	22	1.14	21	35.86	23	35.75	28
Arizona	0.67	42	0.67	44	33.33	37	33.33	48
Arkansas	0.65	45	0.67	44	32.36	45	33.37	46
California	0.73	39	0.72	40	33.94	34	33.80	41
Colorado	7.23	3	6.59	3	51.16	3	49.77	3
Connecticut	0.77	35	0.79	35	33.04	41	33.95	38
Delaware	2.74	5	2.58	5	37.06	17	37.61	16
Florida	2.13	8	1.95	9	38.14	14	38.51	14
Georgia	2.55	6	2.52	6	41.12	7	41.67	7
Hawaii	17.13	2	17.47	2	66.13	2	66.77	2
Idaho	1.29	18	1.17	20	33.95	33	33.83	40
Illinois	1.27	19	1.18	19	35.16	26	35.85	26
Indiana	0.64	48	0.67	44	32.18	48	33.38	43
Iowa	1.64	14	1.53	15	40.82	9	40.92	9
Kansas	0.80	33	0.81	33	34.67	29	35.58	29
Kentucky	0.78	34	0.81	33	33.83	35	34.89	31
Louisiana	1.88	10	1.81	11	39.50	12	39.90	11
Maine	1.63	15	1.56	14	40.02	10	40.18	10
Maryland	0.88	28	0.88	28	35.35	24	36.07	25
Massachusetts	1.25	20	1.22	18	37.51	15	38.07	15
Michigan	0.64	48	0.67	44	32.18	48	33.38	43
Minnesota	1.17	21	1.12	22	36.67	19	37.29	18
Mississippi	21.28	1	21.56	1	70.86	1	72.20	1
Missouri	0.92	27	0.92	27	35.33	25	36.23	23
Montana	1.34	17	1.26	17	39.79	11	39.13	13

Table K2. Stage 2 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States* (Continued)

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Nebraska	0.81	32	0.82	31	34.04	31	35.03	30
Nevada	0.85	29	0.83	30	34.53	30	34.31	34
New Hampshire	0.74	38	0.75	38	33.37	36	34.29	35
New Jersey	1.40	16	1.33	16	36.83	18	37.50	17
New Mexico	0.67	42	0.67	44	33.33	37	33.33	48
New York	1.74	12	1.71	12	39.05	13	39.73	12
North Carolina	1.97	9	2.01	8	40.98	8	41.77	6
North Dakota	0.97	26	0.94	26	35.14	27	35.85	26
Ohio	0.64	48	0.67	44	32.18	48	33.38	43
Oklahoma	0.75	37	0.76	37	33.11	40	34.08	37
Oregon	1.68	13	1.64	13	36.22	21	36.28	22
Pennsylvania	2.28	7	2.30	7	41.19	6	42.12	5
Rhode Island	0.84	31	0.82	31	34.00	32	34.58	32
South Carolina	0.71	40	0.73	39	32.90	43	33.91	39
South Dakota	0.77	35	0.79	35	32.93	42	34.13	36
Tennessee	0.85	29	0.87	29	35.10	28	36.15	24
Texas	0.65	45	0.67	44	32.36	45	33.37	46
Utah	1.14	22	1.12	22	36.48	20	36.44	21
Vermont	0.65	45	0.66	50	32.29	47	33.20	50
Virginia	2.81	4	2.66	4	43.93	4	44.16	4
Washington	1.85	11	1.83	10	41.60	5	41.27	8
West Virginia	0.66	44	0.68	42	32.63	44	33.63	42
Wisconsin	0.70	41	0.72	40	33.33	37	34.42	33
Wyoming	1.06	24	1.04	24	37.27	16	37.15	19

*The relative utilities of all states sum to 100. The absolute utility of each state is between 0 and 100.

Table K3. Stage 3 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Alabama	1.65	25	1.63	25	26.96	18	27.09	18
Alaska	1.13	32	1.12	32	20.29	39	20.45	39
Arizona	3.69	8	3.59	8	36.68	4	36.32	4
Arkansas	1.00	35	0.98	37	22.82	30	22.84	30
California	2.65	13	2.60	13	34.02	6	34.25	6
Colorado	4.78	3	4.86	2	24.48	24	24.96	24
Connecticut	0.69	48	0.69	48	17.11	48	17.41	48
Delaware	0.81	43	0.81	43	17.93	46	18.27	46
Florida	1.43	28	1.38	28	25.01	21	24.99	23
Georgia	1.59	26	1.50	26	23.52	25	23.38	28
Hawaii	6.53	1	6.85	1	25.04	20	25.84	20
Idaho	4.26	4	4.41	4	21.20	36	21.65	35
Illinois	1.00	35	1.01	35	22.21	33	22.60	32

Table K3. Stage 3 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States* (Continued)

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Indiana	1.25	29	1.23	29	21.10	38	21.17	38
Iowa	2.13	17	2.05	18	30.43	10	30.45	11
Kansas	1.16	31	1.17	31	24.67	23	25.11	22
Kentucky	2.33	16	2.24	16	30.07	12	29.92	12
Louisiana	1.97	20	1.98	20	26.64	19	27.08	19
Maine	1.68	23	1.67	23	28.91	13	29.03	14
Maryland	1.05	33	1.06	33	23.42	27	23.83	25
Massachusetts	0.99	37	1.01	35	19.80	41	20.18	40
Michigan	2.06	18	2.07	17	31.47	8	31.80	8
Minnesota	0.75	45	0.75	45	18.66	43	18.96	43
Mississippi	4.97	2	4.81	3	38.60	3	38.01	3
Missouri	1.83	21	1.91	21	25.00	22	25.52	21
Montana	1.71	22	1.77	22	23.51	26	23.83	25
Nebraska	3.85	7	3.79	7	40.61	1	40.57	1
Nevada	0.68	50	0.69	48	17.00	50	17.31	50
New Hampshire	1.19	30	1.18	30	22.60	31	22.75	31
New Jersey	3.98	5	3.90	6	39.39	2	39.14	2
New Mexico	1.67	24	1.67	23	22.92	29	22.98	29
New York	2.83	11	2.82	11	36.06	5	36.24	5
North Carolina	2.40	15	2.53	15	27.17	17	27.74	15
North Dakota	2.79	12	2.78	12	33.13	7	33.16	7
Ohio	1.53	27	1.41	27	22.37	32	21.96	34
Oklahoma	3.54	9	3.39	10	31.43	9	31.30	9
Oregon	3.52	10	3.43	9	28.01	15	27.74	15
Pennsylvania	2.02	19	2.04	19	27.21	16	27.52	17
Rhode Island	0.94	39	0.95	39	21.11	37	21.48	37
South Carolina	0.86	41	0.87	41	21.28	35	21.63	36
South Dakota	0.85	42	0.85	42	19.90	40	20.07	41
Tennessee	0.97	38	0.97	38	22.14	34	22.45	33
Texas	1.04	34	1.05	34	23.15	28	23.54	27
Utah	0.79	44	0.80	44	18.63	44	18.93	44
Vermont	0.71	47	0.72	47	17.76	47	18.06	47
Virginia	2.57	14	2.59	14	28.82	14	29.32	13
Washington	3.86	6	4.06	5	30.26	11	31.04	10
West Virginia	0.74	46	0.75	45	18.59	45	18.89	45
Wisconsin	0.69	48	0.69	48	17.11	48	17.41	48
Wyoming	0.87	40	0.88	40	19.30	42	19.65	42

*The relative utilities of all states sum to 100. The absolute utility of each state is between 0 and 100.

Table K4. Stage 4 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Alabama	1.06	39	1.07	34	23.11	42	23.45	42
Alaska	1.16	25	1.17	25	23.90	25	24.26	24
Arizona	1.07	34	1.07	34	23.16	35	23.50	34
Arkansas	1.07	34	1.07	34	23.16	35	23.49	36
California	1.06	39	1.07	34	23.11	42	23.45	42
Colorado	6.94	2	7.10	2	30.21	10	30.73	10
Connecticut	1.06	39	1.07	34	23.11	42	23.45	42
Delaware	3.57	8	3.62	8	26.30	11	26.70	11
Florida	1.31	19	1.30	19	24.02	22	24.32	22
Georgia	1.43	17	1.44	17	24.71	16	25.09	16
Hawaii	8.73	1	8.66	1	51.71	1	51.78	1
Idaho	3.10	9	3.07	9	25.15	13	25.46	13
Illinois	1.07	34	1.07	34	23.17	34	23.50	34
Indiana	5.96	3	5.92	3	49.71	3	49.83	3
Iowa	1.26	20	1.26	20	24.25	20	24.59	20
Kansas	2.68	11	2.68	11	36.13	8	36.42	8
Kentucky	1.14	28	1.14	28	23.42	30	23.75	30
Louisiana	1.25	21	1.26	20	24.72	15	25.10	15
Maine	1.23	24	1.24	24	24.71	16	25.09	16
Maryland	1.14	28	1.14	28	23.94	23	24.30	23
Massachusetts	3.65	7	3.64	7	36.79	6	37.04	6
Michigan	1.06	39	1.07	34	23.12	40	23.46	40
Minnesota	1.07	34	1.07	34	23.15	37	23.49	36
Mississippi	1.53	15	1.51	15	24.52	19	24.81	19
Missouri	1.24	23	1.25	23	24.73	14	25.11	14
Montana	1.10	31	1.10	31	23.15	37	23.49	36
Nebraska	1.13	30	1.14	28	23.90	25	24.26	24
Nevada	2.07	13	2.03	13	24.16	21	24.46	21
New Hampshire	1.06	39	1.07	34	23.12	40	23.46	40
New Jersey	1.25	21	1.26	20	24.69	18	25.07	18
New Mexico	1.06	39	1.07	34	23.11	42	23.45	42
New York	1.38	18	1.39	18	25.17	12	25.52	12
North Carolina	2.85	10	2.85	10	36.34	7	36.62	7
North Dakota	1.09	33	1.09	33	23.20	32	23.54	32
Ohio	1.06	39	1.07	34	23.11	42	23.45	42
Oklahoma	1.07	34	1.07	34	23.18	33	23.52	33
Oregon	1.53	15	1.51	15	23.59	27	23.90	27
Pennsylvania	5.18	5	5.15	5	48.61	4	48.76	4
Rhode Island	1.15	26	1.15	26	23.46	29	23.79	29
South Carolina	1.06	39	1.07	34	23.13	39	23.47	39
South Dakota	1.10	31	1.10	31	23.30	31	23.63	31
Tennessee	1.55	14	1.53	14	23.91	24	24.22	26
Texas	2.59	12	2.59	12	35.35	9	35.62	9
Utah	1.06	39	1.07	34	23.11	42	23.45	42
Vermont	1.06	39	1.07	34	23.11	42	23.45	42

Table K4. Stage 4 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States* (Continued)

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Virginia	2.57	14	2.59	4	28.82	14	29.32	13
Washington	1.15	26	1.15	26	23.57	28	23.88	28
West Virginia	1.06	39	1.07	34	23.11	42	23.45	42
Wisconsin	4.01	6	3.97	6	37.87	5	38.11	5
Wyoming	1.06	39	1.07	34	23.11	42	23.45	42

*The relative utilities of all states sum to 100. The absolute utility of each state is between 0 and 100.

Table K5. Stage 5 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
Alabama	1.26	28	1.27	28	17.99	28	18.86	26
Alaska	1.38	20	1.40	20	21.83	16	22.90	14
Arizona	0.95	35	0.94	37	13.70	36	14.29	36
Arkansas	3.65	5	3.53	5	36.46	3	36.73	3
California	1.30	25	1.31	25	19.72	22	20.68	21
Colorado	0.75	46	0.74	46	8.65	46	9.03	46
Connecticut	0.80	40	0.79	40	10.53	38	11.00	38
Delaware	0.75	46	0.74	46	8.65	46	9.03	46
Florida	2.37	7	2.33	8	25.98	8	26.56	9
Georgia	1.58	15	1.50	16	18.56	25	18.66	27
Hawaii	0.75	46	0.74	46	8.65	46	9.03	46
Idaho	0.75	46	0.74	46	8.65	46	9.03	46
Illinois	2.09	11	2.09	11	19.88	21	20.67	22
Indiana	0.80	40	0.79	40	10.53	38	11.00	38
Iowa	0.95	35	0.95	36	14.25	33	14.86	33
Kansas	0.80	40	0.79	40	10.53	38	11.00	38
Kentucky	1.44	18	1.43	18	21.99	13	22.81	15
Louisiana	0.95	35	0.95	35	14.25	33	14.86	33
Maine	13.10	1	14.01	1	36.52	2	38.18	2
Maryland	2.33	9	2.26	9	18.47	26	18.63	28
Massachusetts	2.70	6	2.65	6	27.27	7	27.98	7
Michigan	1.03	31	1.04	31	16.72	29	17.63	29
Minnesota	1.35	22	1.36	22	20.33	19	21.29	19
Mississippi	1.34	23	1.34	23	16.17	30	16.81	31
Missouri	2.08	12	2.02	12	27.76	6	28.34	6
Montana	1.31	24	1.32	24	19.65	23	20.62	23
Nebraska	1.03	31	1.04	31	16.02	31	16.91	30
Nevada	0.75	46	0.74	46	8.65	46	9.03	46
New Hampshire	0.77	45	0.76	45	8.95	45	9.34	45
New Jersey	1.27	26	1.28	26	19.96	20	20.99	20
New Mexico	1.27	26	1.28	27	18.44	27	19.43	25
New York	1.64	14	1.65	14	21.88	15	22.75	16

Table K5. Stage 5 Relative and Absolute Utilities of the NDM Websites of the 50 U.S. States*

State	Relative Utility (RU)				Absolute Utility (AU)			
	Expert		User		Expert		User	
	RU	RU Rank	RU	RU Rank	AU	AU Rank	AU	AU Rank
North Carolina	11.97	2	11.43	2	49.73	1	49.59	1
North Dakota	1.36	21	1.38	21	21.53	17	22.59	17
Ohio	1.80	13	1.74	13	24.06	12	24.57	12
Oklahoma	2.37	7	2.38	7	25.73	9	26.68	8
Oregon	0.78	44	0.77	44	9.29	44	9.68	44
Pennsylvania	2.21	10	2.22	10	25.18	10	26.19	10
Rhode Island	1.01	33	1.00	33	13.33	37	13.87	37
South Carolina	1.40	19	1.42	19	21.98	14	23.05	13
South Dakota	1.13	29	1.14	29	18.62	24	19.62	24
Tennessee	1.47	17	1.49	17	21.48	18	22.52	18
Texas	0.80	40	0.79	40	10.53	38	11.00	38
Utah	1.06	30	1.06	30	14.24	35	14.79	35
Vermont	1.53	16	1.55	15	24.81	11	25.92	11
Virginia	6.41	4	6.21	4	32.49	4	33.34	4
Washington	0.98	34	0.99	34	15.45	32	16.33	32
West Virginia	0.84	38	0.83	38	10.20	42	10.60	42
Wisconsin	6.77	3	7.00	3	31.04	5	32.36	5
Wyoming	0.84	38	0.83	38	9.61	43	10.01	43

*The relative utilities of all states sum to 100. The absolute utility of each state is between 0 and 100.

Appendix L

Post Hoc Analysis of the Association of Age, Gender, and Experience with User Ratings of Preparation of Various Disaster Types

Rating of Disaster Preparation	Gender Coefficient, (Female=0, Male = 1) (p-value)	Age Coefficient (p-value)	Corresponding Exp Coefficient (p-value)
Tornado	-.442 (.000)	.008 (.041)	.032 (.073)
Hurricane	-.782 (.000)	-.019 (.008)	.176 (.000)
Tsunami	-.703 (.003)	-.034 (.000)	.061 (.152)
Flood	-.606 (.000)	.001 (.821)	.037 (.084)
Volcano	-.873 (.001)	-.033 (.000)	.201 (.000)
Winter Storm	-.553 (.000)	-.007 (.203)	.230 (.000)
Thunderstorm and Lightning	-.374 (.027)	.010 (.056)	.113 (.001)
Wildfire	-1.050 (.000)	-.005 (.471)	.135 (.000)
Extreme heat	-.797 (.000)	-.014 (.014)	.178 (.000)
Heat wave	-.729 (.000)	-.015 (.011)	.158 (.000)
Drought	-.882 (.000)	-.019 (.001)	.162 (.000)
Hail	-5.86 (.001)	-.009 (.114)	.185 (.000)
Landslide	-1.183 (.000)	-.030 (.000)	.171 (.000)
Earthquake	-1.088 (.000)	-.019 (.004)	.097 (.004)

Appendix M

The Evaluation Process

Since website contents could be frequently updated, it is necessary to reassess the contents of NDM websites. The evaluation process is as follows:

1. Follow the 50 URLs listed in Appendix H and download all relevant webpage_{*ij*} ($i = 1, 2, \dots, 50; j = 1, 2, \dots, n_i$), where webpage_{*ij*} denotes the j^{th} webpage of state i , and n_i denotes the total number of webpages of state i .
2. For each state i ($i=1,2,\dots,50$),
 - 2.1 Mark all atomic ontology elements as 0 (for “absent”).
 - 2.2 For each webpage_{*ij*} ($j=1,2,\dots,n_i$),
 - 2.2.1 Bin the webpage into one of the five stages of NDM in the ontology, k .
 - 2.2.2 Look for each stage- k atomic ontology element whose value is 0 in the webpage. Once found, change the value of the atomic ontology element to 1 (for “present”).
3. Use the evaluation tool to assess the absolute or relative utilities of the websites.