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Media Influence Modeling

in support of

Conflict Modeling, Planning, and Outcome Experimentation (COMPOEX)

Presented at MORS Irregular Warfare Analysis Workshop

4-6 Feb 2009

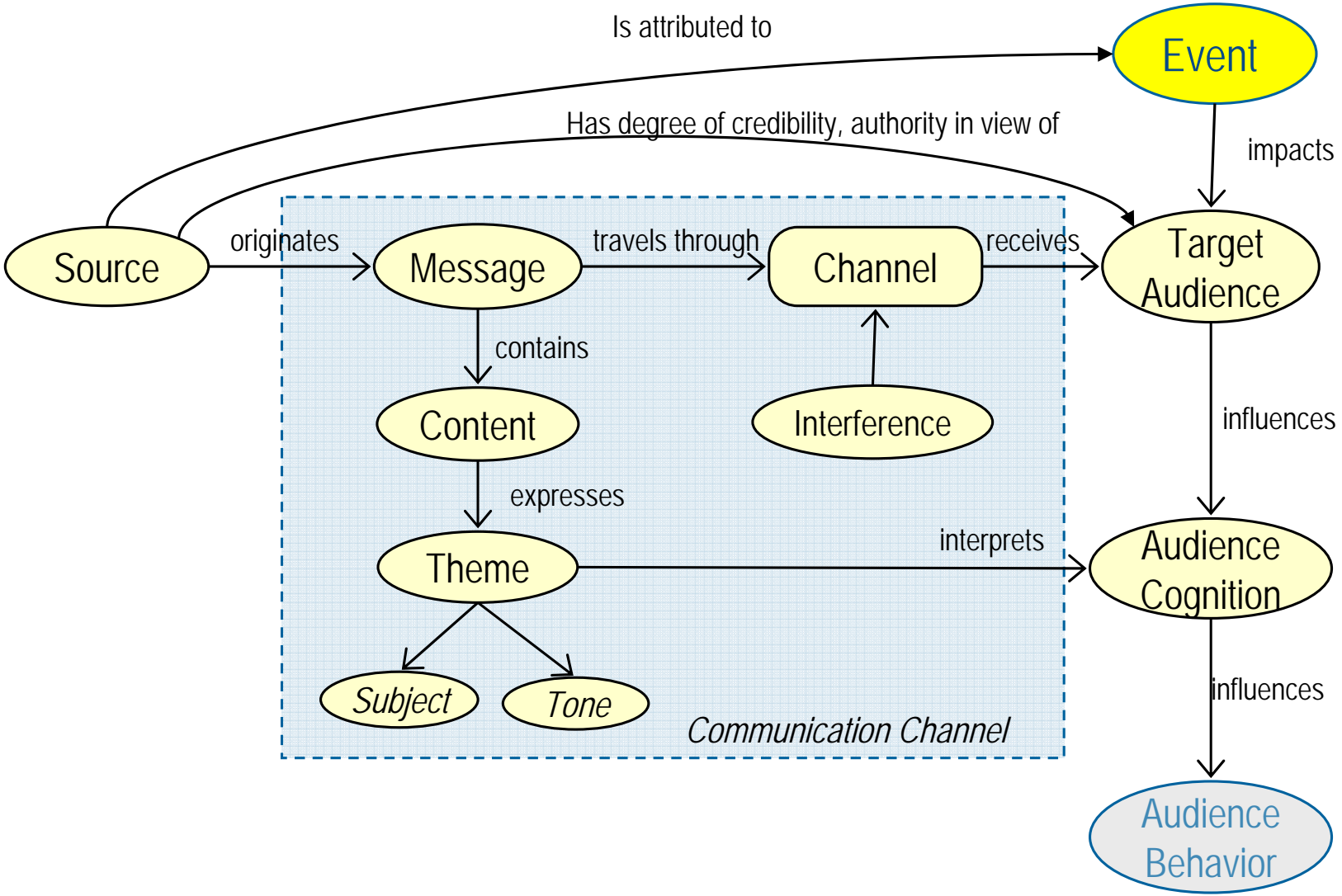
MacDill AFB

Dr. William Bennett

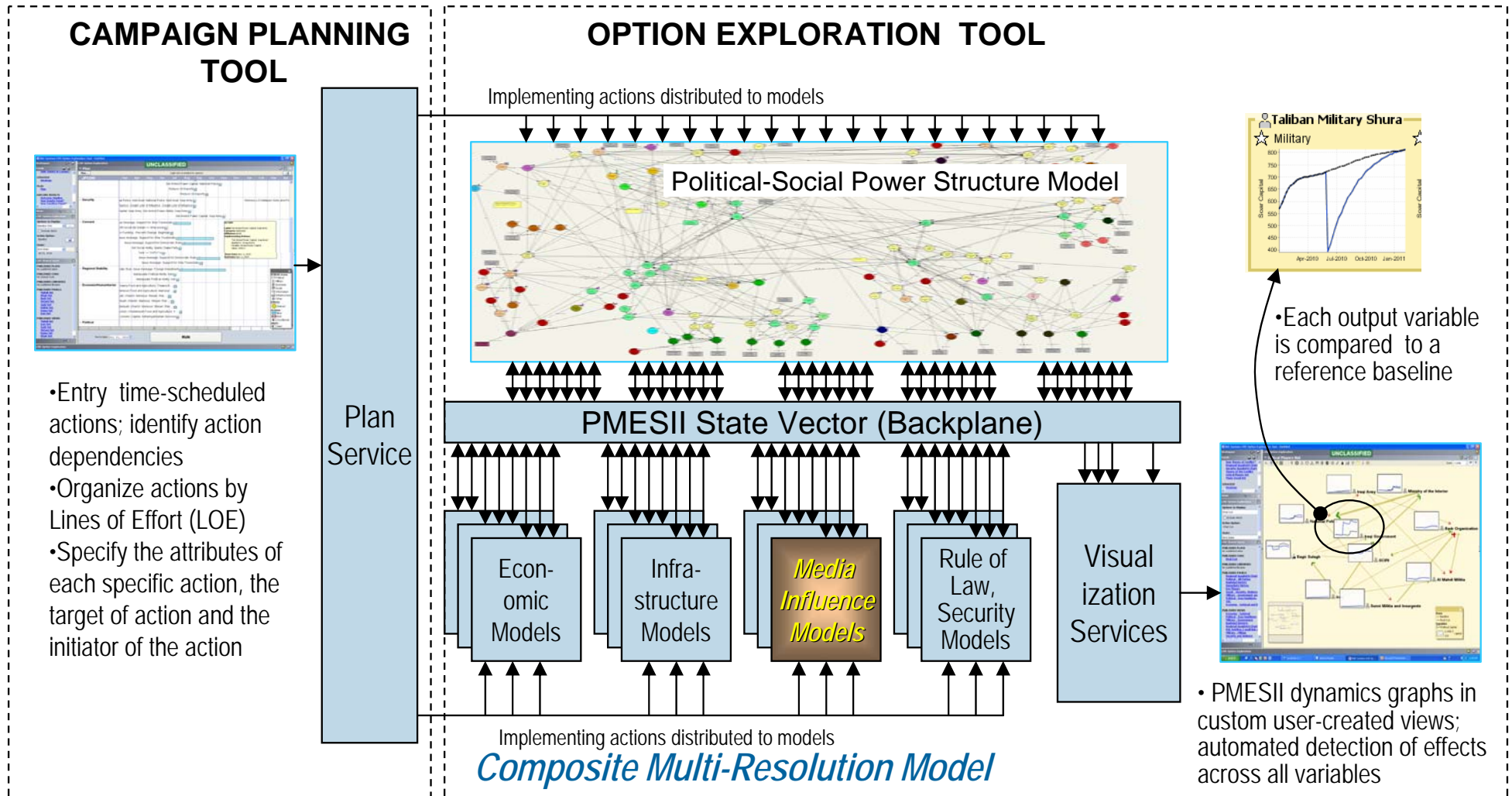
BAE Systems, Advanced Information Technologies

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Causal Model of Public Communication Effects



Conflict Modeling, Planning, and Outcome Experimentation (COMPOEX) High-level Architecture



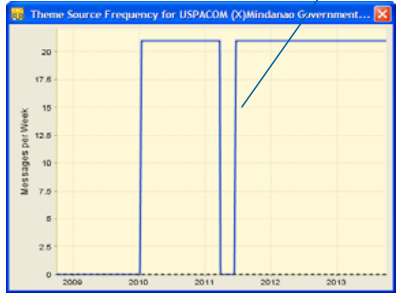
MIM is one component model developed to interact within a composite PMESII representation

COMPOEX Influence Campaign / Media Effects Forecast

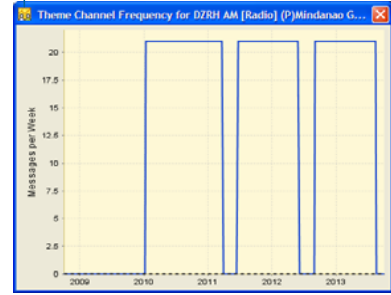
Theatre Security Cooperation Plan*

Philippines TSCP	2009	2010	2011
Ship Visits	Military Ship Visit: Mindanao	06.02 Military Ship Visit: Mindanao	
	Aid for Health Care: Mindanao	07.03 Economic Aid: Philippines	
		06.02 Military Ship Visit: Mindanao	
	Infrastructure Aid for Health Care: Mindanao		
		07.03 Economic Aid: Philippines	
		06.02 Military Ship Visit (Morale): Rest of Philippines	
High Level Visit	Communications Messaging		
	Visit: Rest of Philippines		
	Military Visit: Rest of Philippines		
	Visit (JATF-West): Rest of Philippines		

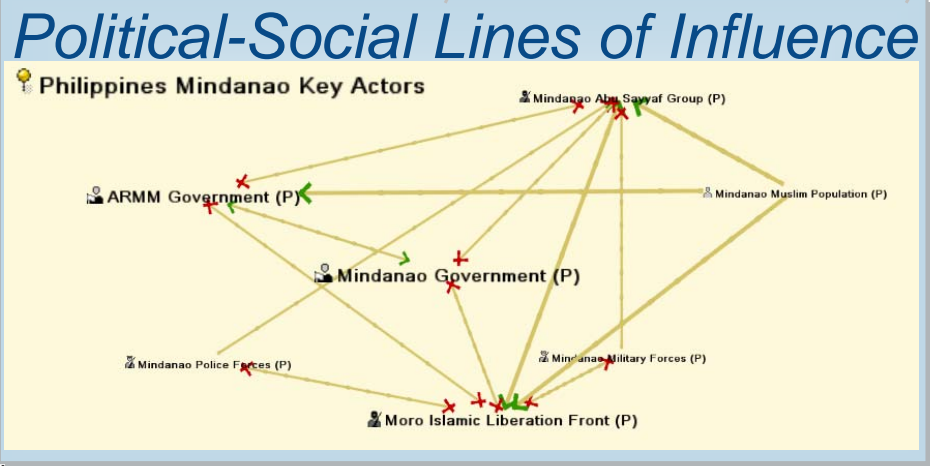
Media theme coverage / source attribution exposes public to USG message



Media Theme Sourcing

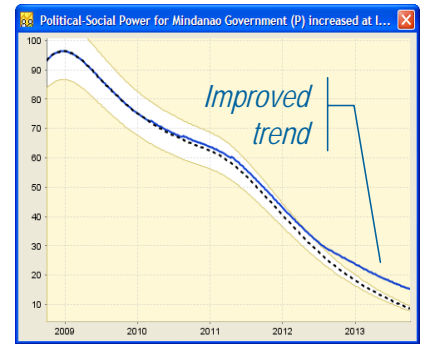


Media Theme Coverage

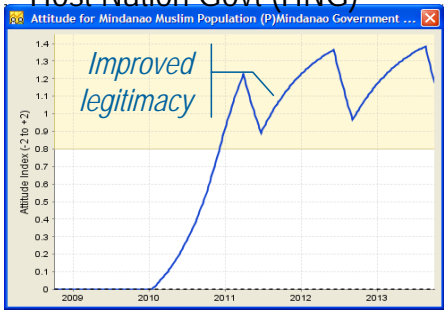


--- Baseline
— Plan Impacts / Effects

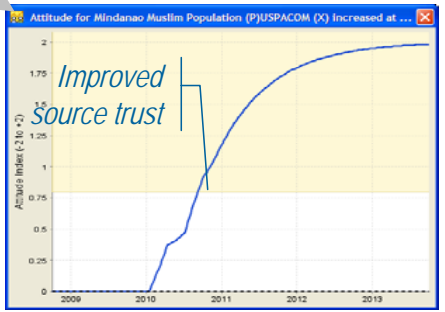
HNG Political-Social Power



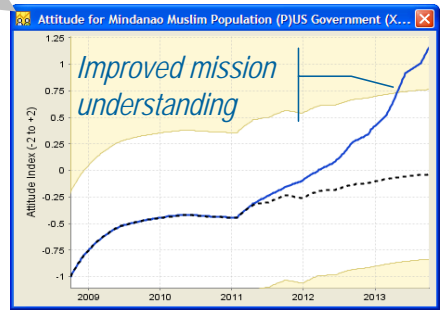
Public Attitude towards Host Nation Govt (HNG)



Public Attitude towards Advocate



Public Attitude towards USG

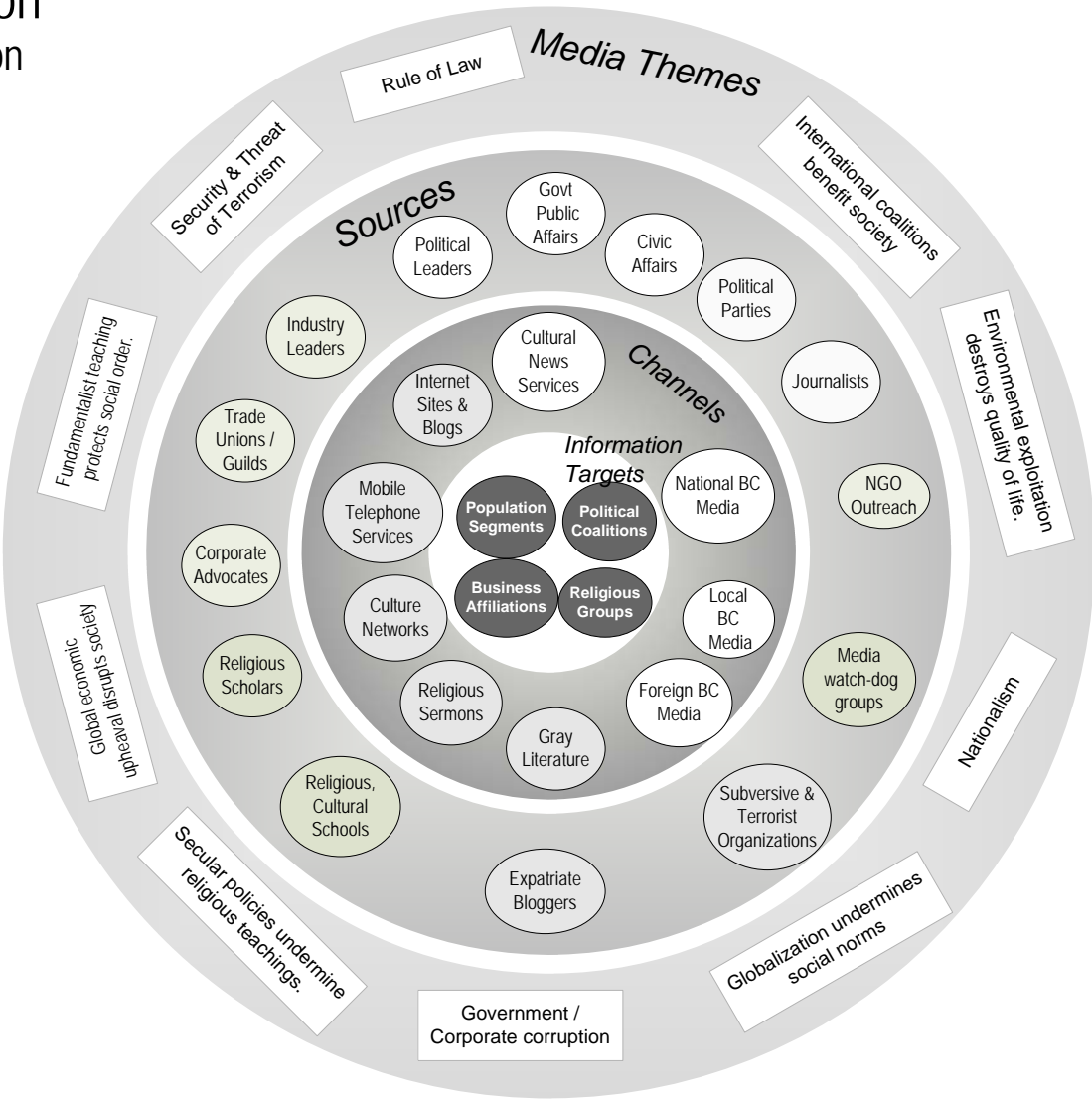


* Hypothetical TSCP analysis in Philippines

Media Influence Modeling Overview

- *Purpose:* represent persuasive influence of media channels on audience opinion formation
 - Estimate message acceptance and opinion formation
 - Message factors that impact influence
 - Message tone / rhetorical intensity
 - Message content / framing towards theme subjects
 - Legitimacy – political / legal authority
 - Affinity – cultural / social affiliation
 - Competency – economic / financial / business affiliation
 - Rhetorical Intensity / Reinforcement / Acceptance
 - Represent impact of media broadcast channels

- Knowledge Elements that Characterize a Public Information Environment
 - *Media Themes:* (Political, Social, Economic)
 - *Public Information Sources:* Opinion Leaders, Spokespersons, Civil Society Leaders, Journalists
 - *Channels:* Public Information, Broadcast Media, Internet, Mobile Telecom Services
 - *Influence Targets:* Public Audiences / Stakeholders



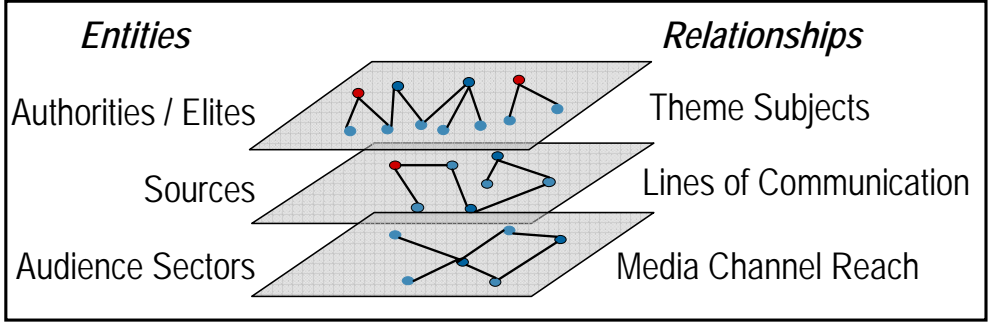
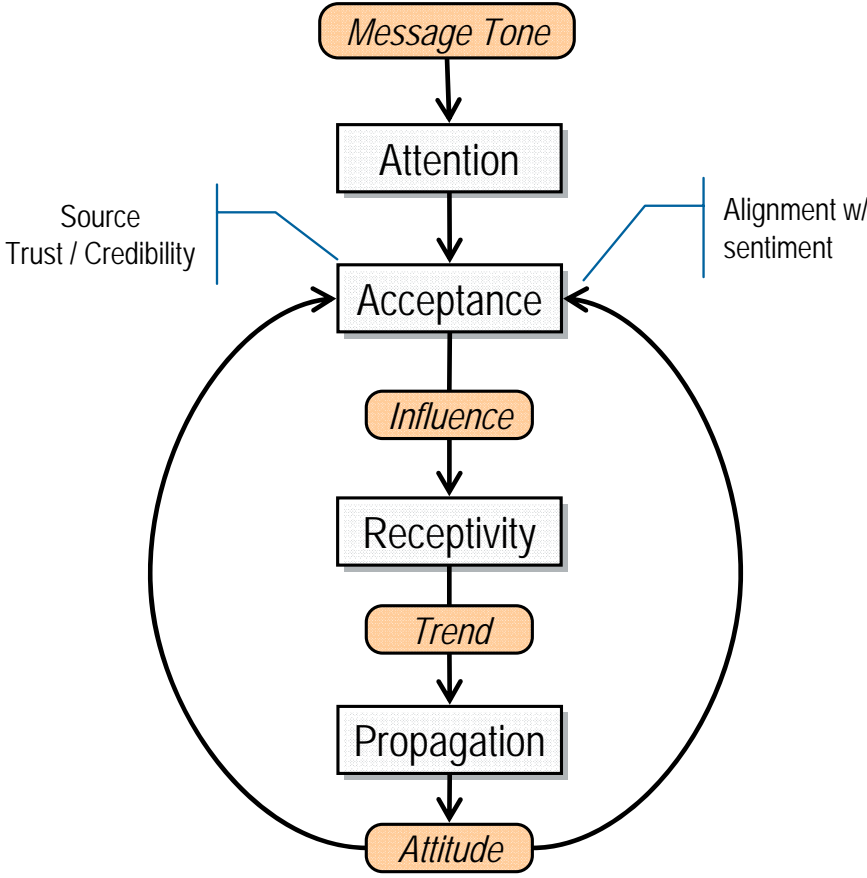
Public Information Environment

MIM Uses Hybrid Modeling Paradigm

- *Objective: Represent Domain Knowledge*
 - Public Information Environment
 - Communication Medium
 - Target Influence Receptivity
- *System Dynamics: Time Evolution of Effects*
 - Audience Message Exposure
 - Influence Effects

Variables:

 - Message Tone / Content
 - Public Trends / Attitudes
 - Theme Coverage
 - Source Activity
- *Agent-Based System: Entity Behaviors*
 - Named Entities
 - Influence Relationships
 - Entity Influence Behaviors

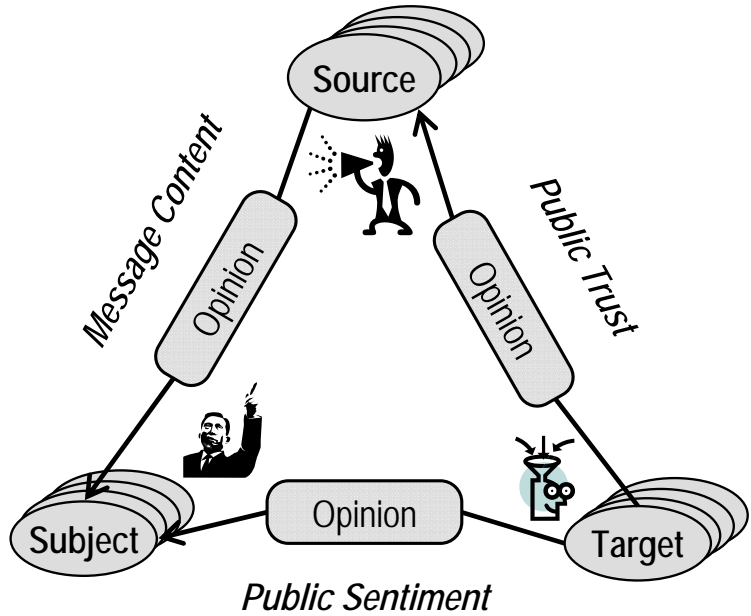
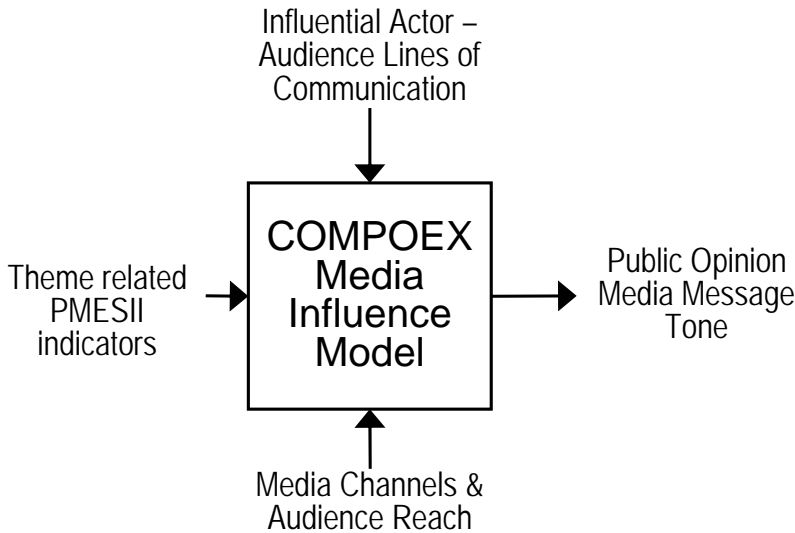


Media Influence Modeling Framework

- *Purpose:* Forecast influence of media information on public attitudes / opinions toward subject entities
 - Media theme coverage of rhetorical discourse
 - Attitude formation / diffusion in social context
 - Media outlet behavior (coverage / bias)
 - Public exposure to media theme coverage
 - Impact of Information Actions

- Domain Knowledge Representations
 - Public Information Environment
 - Media Channels / Audience Reach
 - Rhetorical Contest between sources
 - Trusted source relations (Lines of Communication)
 - Influence Acceptance: Trust / Credibility
 - Media Outlet Theme Coverage Self-selection
 - Topical Priority
 - Theme PMESII Indicators

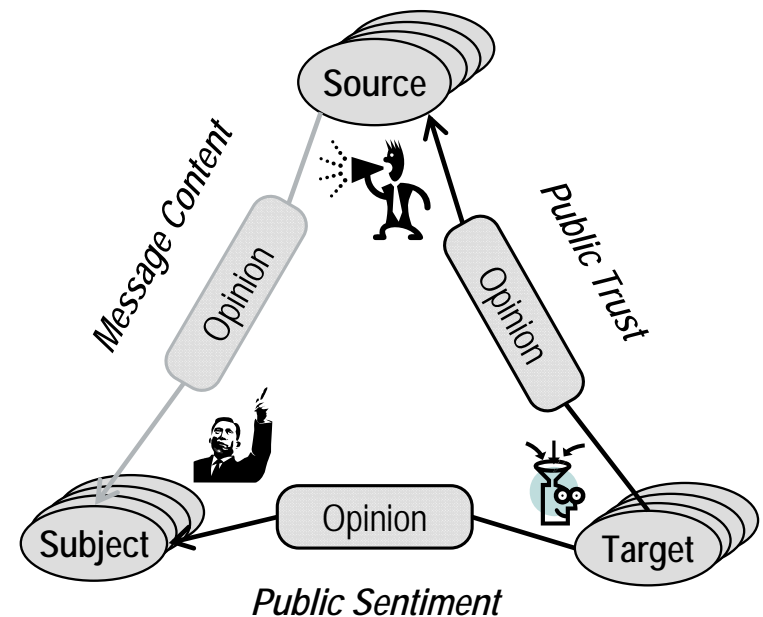
- *Computation:* Estimates formation of opposing / supporting attitudes of targets towards subjects & sources
 - *Targets:* population sectors
 - *Subjects:* entities / organizations
 - *Sources:* influential actors



Theoretical Underpinnings

- Agenda-setting Theory
[McCombs & Shaw 1972]
 - Theme elevation & audience attention
- Opinion Leadership Theory
[Berlo 1966]
 - Message acceptance and public receptivity
- Social Influence Theory
[Latane 1981]
 - Propagation of opinions in social network of communication influence relationships
- Co-Orientation Theory
[Ajzen & Fishbein 1980]
 - Source confidence & message interpretation
- Priming & Framing Theory
[Scheufele & Tewksbury 2007]
 - Evolving message acceptance in context
- Information Theory
[Shannon 1948]
 - Message exposure and channel distortion

Persuasive Influence Of Public Media



Variation in Media Rhetorical Tone & Public Attitude

- *Attitude* (supportive/opposition position): Expressed by source A towards theme subject B on topic:
 - *Legitimacy* – reflects position on political legitimacy of subject
 - *Affinity* – reflects position on social standing of subject
 - *Competency* – reflects position on economic competency of subject
 - Attitude variable: Rhetorical scale

Opinion	Hard Opposition	Soft Opposition	Undecided	Soft Support	Hard Support
Attitude	-2	-1	0	+1	+2

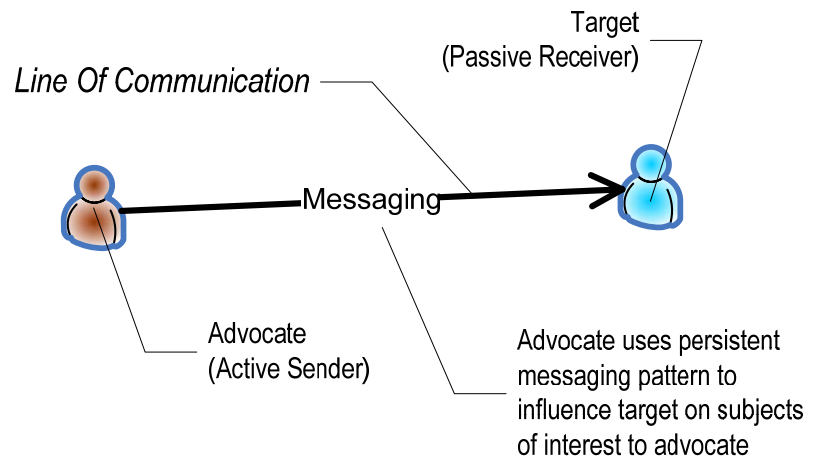
- Represents fraction of media-expressed evidence of position of A towards B.

Audience *acceptance / resistance* depends on:

- *Trust*: Audience A towards Source S reflects combination of Competency and Affinity of A towards S
- *Credibility*: Audience A towards Source S reflects combination of Competency and Legitimacy of A towards S

Entities / Relationships in a Public Information Environment: *Lines of Communication*

- Purpose: Represent persistent relationship between trusted source and affiliated audience
- Source Behavior Model
 - Promotes priority messages to affiliated target audiences
 - Message priority
 - Strong position on subject
 - Disagreement of position w/ affiliate
 - Messaging Capacity
 - Maximum messages sent per week.
 - Transmits on Source preferred channels
 - E.g. religious leader advocates message using religious print media (bulletins, sermons, scholarly literature, other gray media)



Public Communication Medium: *Media Channels*

■ Reach

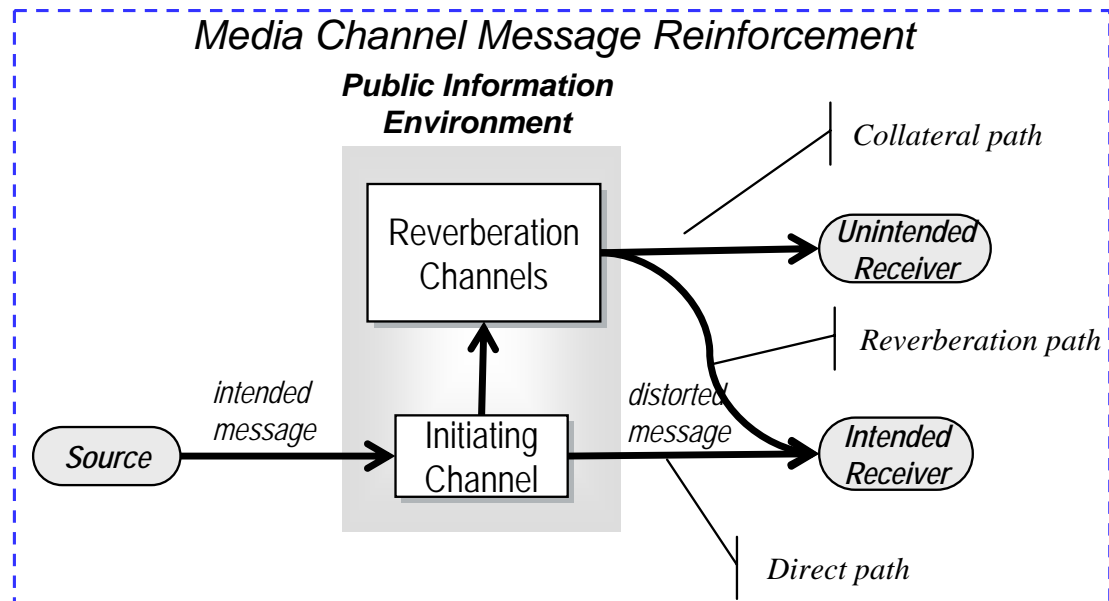
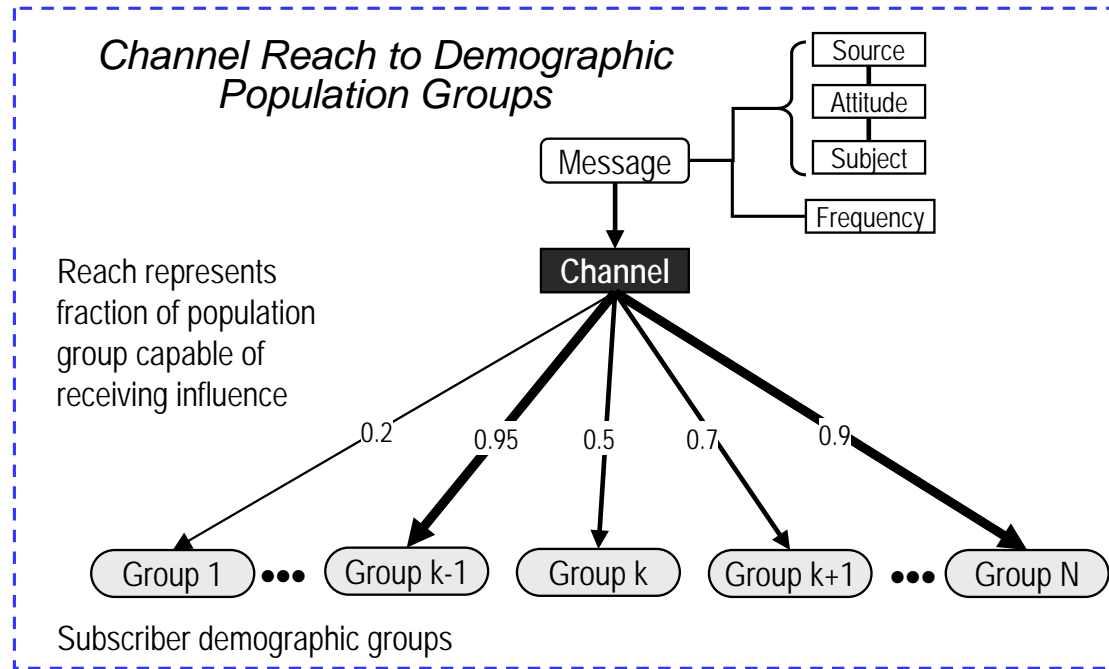
- Target audience exposure
- Regional/cultural coverage
- Population access (rural / urban)
- Regulatory environment:
 - Nationalized / Restricted
 - Public / Private

■ Message Frequency

- Supported by channel
- Needed to break thru clutter and create impact

■ Channel-message distortion

- Interpretation / bias
- Selective response to priority themes / associated current events (PMESII indicators)



Model Instantiation Experience

- Stabilization / Reconstruction Mission in Middle Eastern Country
 - *Themes:* Bi-polar political-social conflict
 - *Constituencies:* national vs regional stakeholders, tribal/ethnic groups, jihadi / subversive elements
 - *Channels:* limited broadcast media, gray media,
- Shaping Mission South East Asia Multinational Region
 - *Themes:*
 - Decentralization
 - Globalization
 - Corruption
 - *Constituencies:* cross-border/migrant sectors, ethnic sectors, government / corporate alliances,
 - *Channels:* multi-cultural/ethnic channels, ubiquitous broadcast media, mobile telecom/SMS,
- Lesson Learned
 - Opinion surveys have limited value
 - Structured / fragile
 - "Old News"
 - Static snap shot - missing trend indicators
 - SME elicitation: limited understanding of media reach & public receptivity

Open Source Analysis

Media
 Pedia Wiki
 Media Tenor Reports



Audience
 Analysis
 Media
 Survey
 Reports

Demographic
 Analysis
 Reports

Media
 Channel
 Survey
 Reports



*Subject Matter Expert
 Elicitation*

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