

# Multiple attacks on transport infrastructure: an inter-disciplinary exploration of the impact of social networking technologies upon real time information sharing, response and recovery

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The  
University  
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Engineering and Physical Sciences  
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# Simple attacks...

- The *Aum Shinryko* attack on the Tokyo Subway in 1995 was perpetrated using liquid Sarin, plastic bags and umbrellas
- The 7/7 attacks on the London Underground in 2005 used homemade organic-peroxides packed into rucksacks

# ...impact on communications...

7/7 attacks:-

- Failure of several mobile phone systems due to increased traffic
- Vodaphone, initiated ACCOLC (Access Overload Control Scheme procedures) to limit calls by the general public.
- Complete closure of the London transport system,
- Special measures to ensure that financial markets would keep trading

## ..and lead to auto-poetic responses

- Police had to revert to runners to carry messages
- BBC (British Broadcasting Corporation in the absence of systematic news reporting) put out its first public call for user generated content (and received thousands of images and texts)
- Bank of England used ‘chat rooms’ to reassure financial markets.



facebook

You Tube

bebo



Technorati

USTREAM TV BETA



del.icio.us

flickr

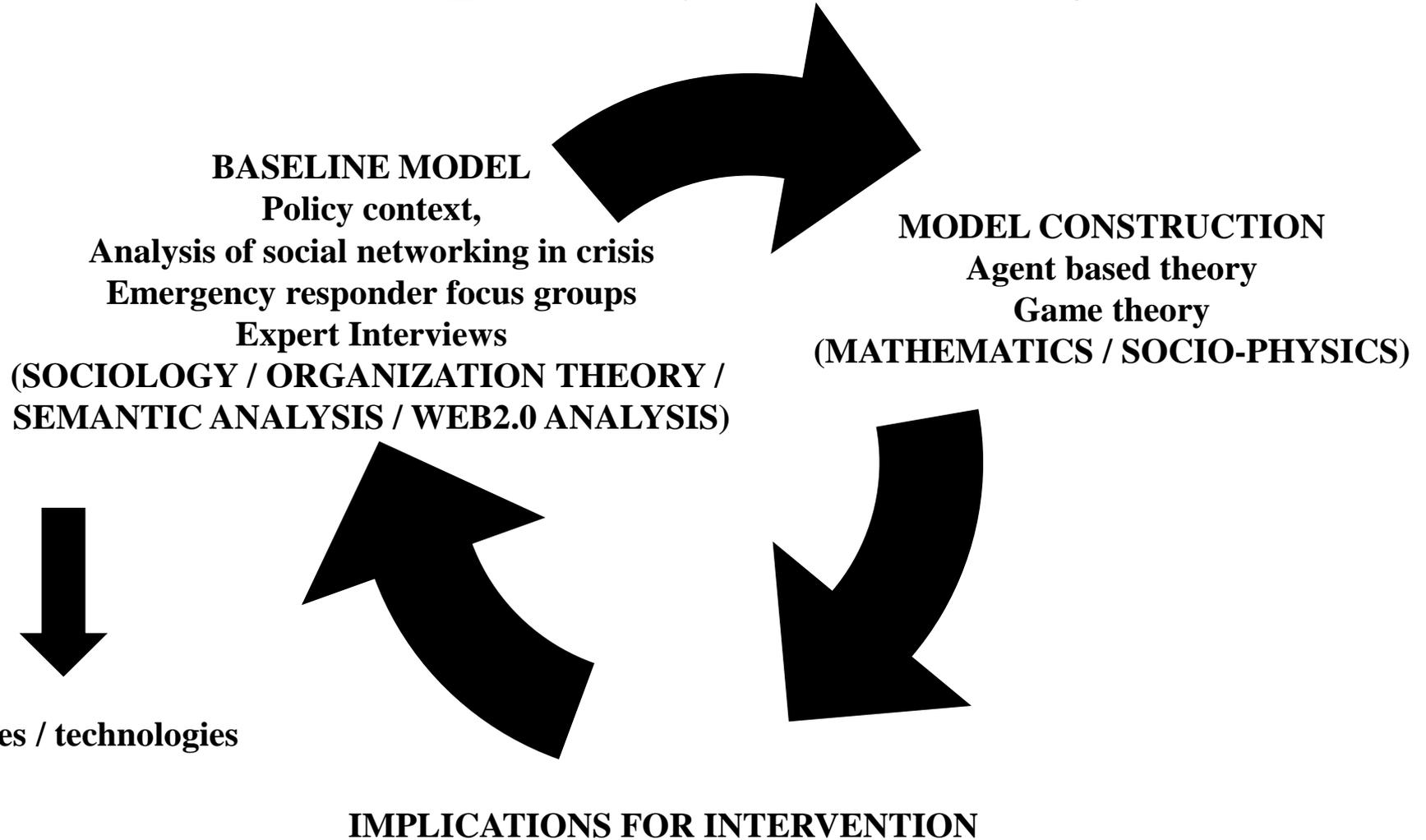


WORDPRESS

# Project details

- Project title '**Game theory and adaptive networks for smart evacuations**'
- Funded by Engineering and Physical Sciences Research Council (EPSRC)
- October 2010 – September 2012
- 864K

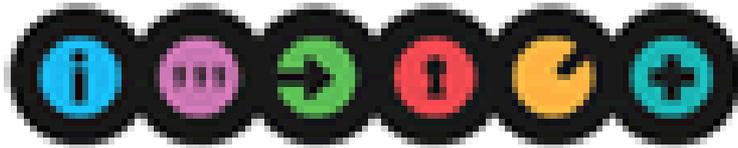
# Interdisciplinary and integrated





# Differences in social media / citizen orientation

## LONDON RESILIENCE



preparing for emergencies



Preparing for

Emergencies in Cumbria

## 2. Situational awareness and social networking over time



# Cork Crash 10/02/2011

- Flight Avia No FLT400C from Belfast to Cork crashes at Cork Airport at 10.15 – 12 people on board
- Cork Airport Major Emergency Plan activates at 10.18, and stands down at 11.04am.
- 6 casualties and 6 survivors

First twitter post

Cork airport closed, expected to be due to an incident with a light aircraft. **#fb** [posted at 10.34am, from Co. Clare - ROI]



# Twitter DATA

## (UK/IE geo-located tweets )

1. 10/12 Feb all tweets = 342,025 records {72hr dataset}
2. From 72hr dataset select records containing the word 'Cork' or 'Crash' (it includes #Cork, #Crash) = 429 records {72hr\_subsample}
3. Identify Relevant/Irrelevant records from the subsample ( => Ushaidi Sweeper review method)
4. Remove Irrelevant records = 243 records {CorkCrash\_dataset}

# Method (Manual Annotation)

CorkCrash\_dataset

1. Annotate the dataset with Conversation Types (edit list from *Java et al 2007*)
  - Open
  - Directed (@)
  - Retweeted (RT)
2. Annotate sample with content type - relate to Situational Awarenesses (SA) categories (*Endsley 1995*)
  - Perception
    - Information seeking
    - Information sharing
  - Comprehension
    - Emotional engagement
  - Projection
    - Opinion sharing

# CorkCrash\_dataset: conversation type

## **Open (broadcasted)**

“What's happening in #cork airport?”

## **Directed (addressed to a specific audience @)**

“@username Plane crash at Cork. Hope your flight isn't fiddled”

## **Retweeted (RT)**

“[...] RT @rtenews: **BREAKING**: Reports from Cork Airport scene say eight people\* have died and 14 others have been injured in the crash”

# CorkCrash\_dataset Content type/ (mapped on SA phases)

## SA Phase 1: Perception

- Information Seeking “What's happening in #cork airport?”
- Information Sharing “Plane crashes in Cork Airport” (includes post with links)

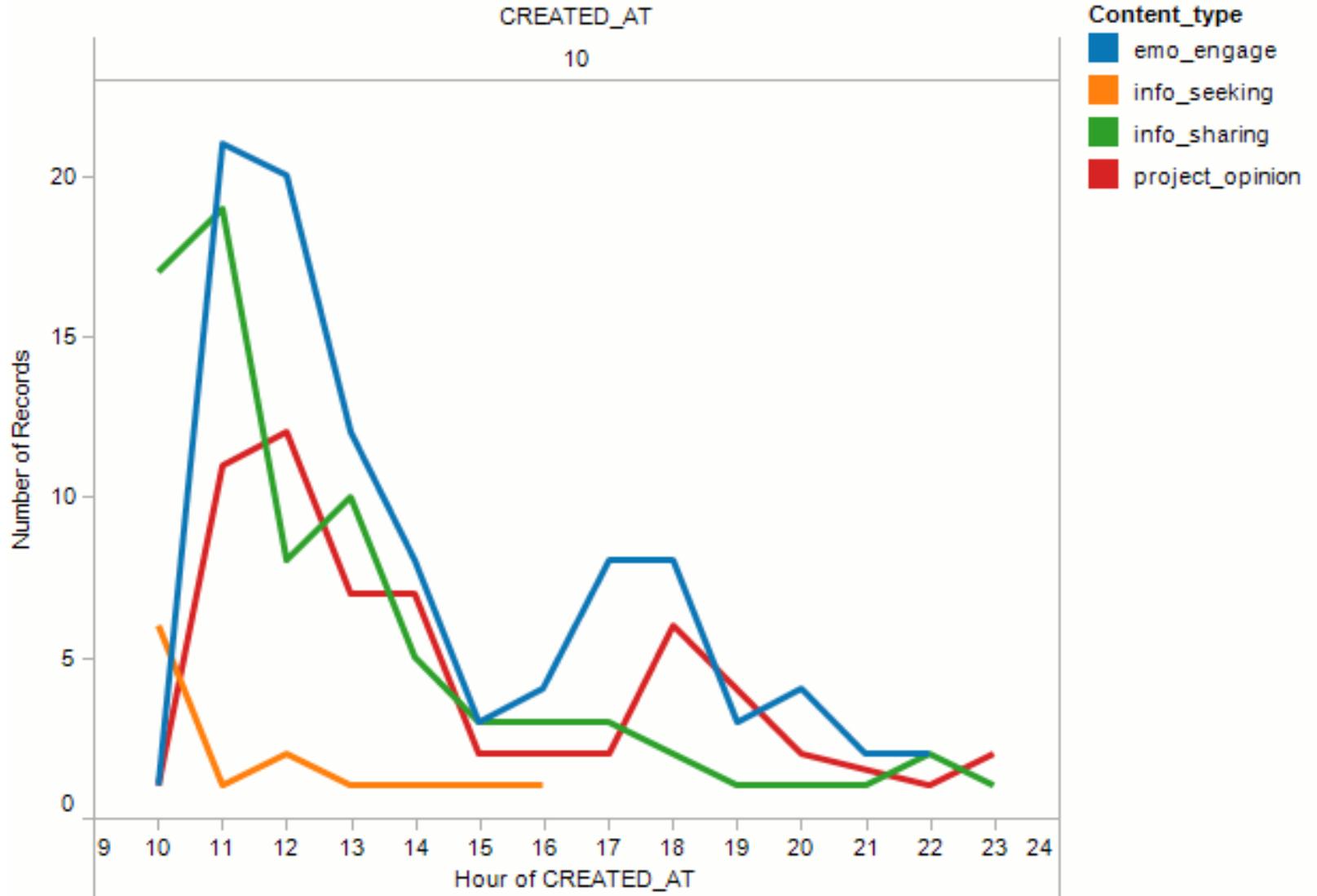
## SA Phase 2: Comprehension

- Emotional Engagement “Very sad news in Cork. Thoughts with the families of the victims.”

## SA Phase 3: Projection

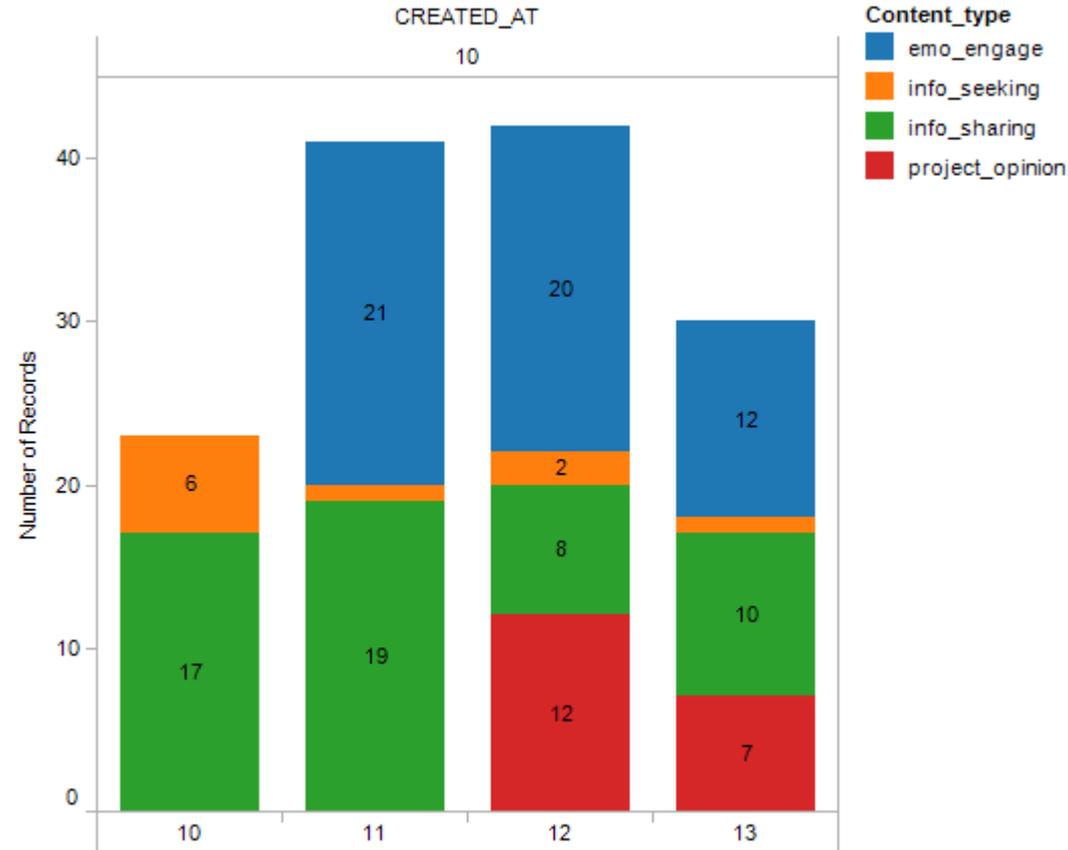
- Reflection/Opinion Sharing “Re #corkaircrash ... They'll be checking the flight and weather tapes. Who still uses tape for backup storage?”

# CorkCrash – Content types over time (10/02/2011 only)



# Observations

- Phase 1: the public seeks and shares information (*perception*)
- Phase 2: as the public gains an understanding of the event (*comprehension*), tweets are used to show emotional engagement
- Phase 3: the public shares opinions, insights and suggestions (*projection*)



Content type (within the first four hours of the crash 10.00/16.00)

# Info Sharing/Seeking

- Information about number of casualties and the detail of the accident varies over time and it is ‘self correcting’
  - “RTE just mentioned unconfirmed reports of 8 dead at Cork Airport [...]” (10.41am)
  - “Now - 3 confirmed dead @ Cork Airport #cork” (11.13am)
  - “6 Now confirmed dead in Cork plane crash.” (11.51am) (first to mention the correct number of casualties – all to report six casualties afterwards)

# Emotional Engagement

- “**R.I.P** to all those who died on the plane crash in Cork #prayingforthem”
- “**Thoughts** with all the People in this Morning's Air Crash in Cork Airport.”
- “Very **sad news** in Cork. Thoughts with the families of the victims.”

# Opinion/Insight/Suggestions

- “That air accident in Cork two missed approaches then divert the norm - three attempts considered potentially fatal always”
- “Location of Cork airport was deemed unsuitable by expert report 50 years ago due to 'prevalence of fog' -

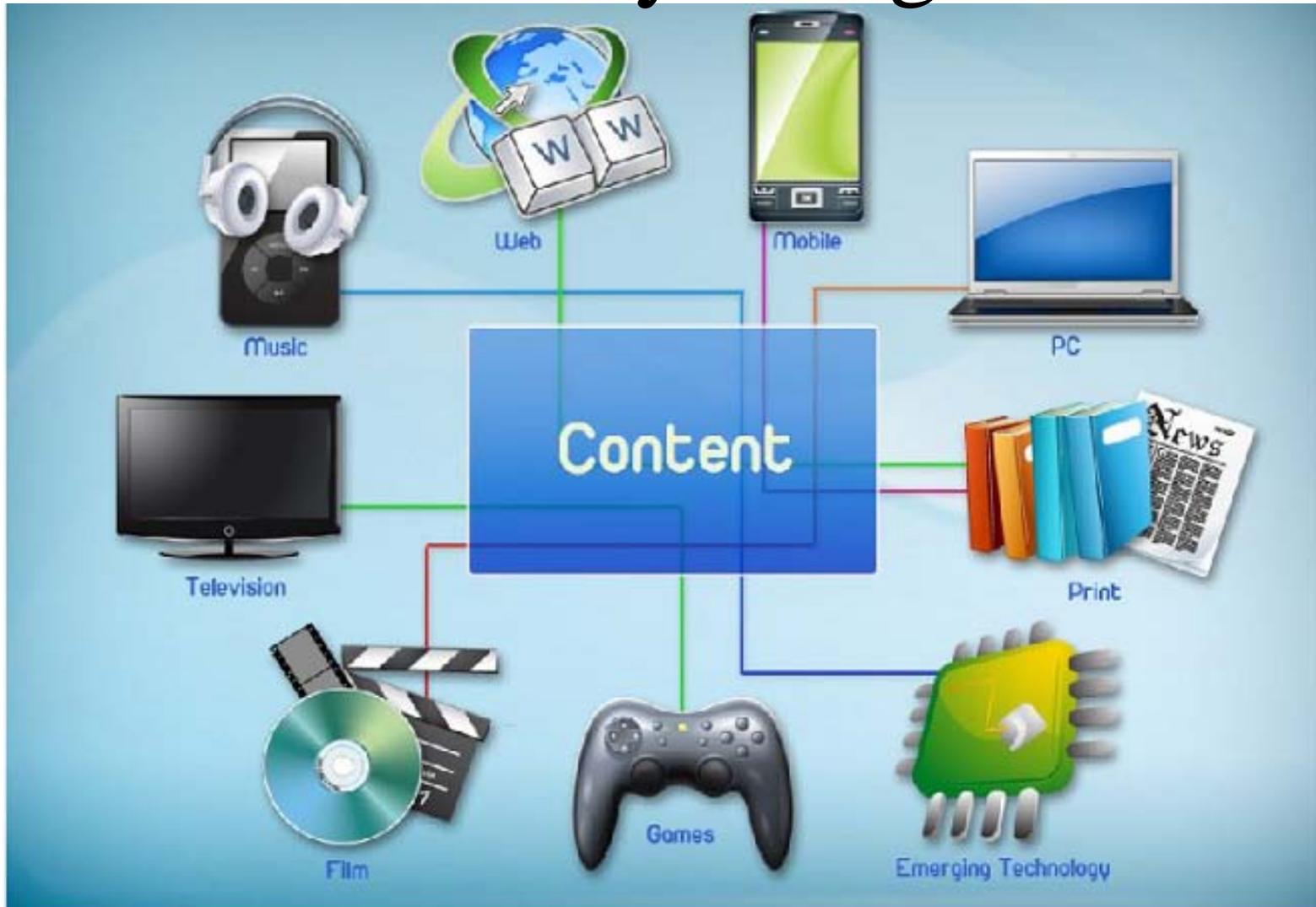
<http://bit.ly/gq8fCP> - **MOVE TO BLOG: TRANSMEDIA**

“[...]it is no surprise to me to find that it is costing a few million pounds now to throw light enough to banish the fog over Ballygarvan. I certainly object to the pull of business interests in Cork City against the money being used on the most suitable site that was found by the meteorological experts, namely, the site at Ahanesk near Midleton””



The screenshot shows the website for the Houses of the Oireachtas. The header includes navigation links for Home, Gaeilge, and Site Map, along with Contact, Print, and Mot options. The main content area features a search bar and a navigation menu with categories like About, TDs & Senators, Oireachtas Business, Visits & Events, Watch & Listen, Media Zone, and Education. The current page is a debate page titled "Committee on Finance. - Vote 50— Industry and Commerce (Resumed)." dated Thursday, 12 June 1958. The page content includes a quote: "That the Estimate be referred back for reconsideration"—(Deputy Cosgrave). and a statement by Mr. Crotty: "I was speaking last night about cross-Channel container traffic. I believe it is one of the most important matters mentioned in connection with this Estimate this year. We are seeking efficiency in industry and efficient marketing conditions and I think that the utilisation of container traffic would help to a great extent to [1576] increase efficiency in the transport of agricultural and industrial goods. It is a matter which has a bearing on our whole economy. It would be a great advantage if industrialists here could pack their goods into these containers on their own premises and send the goods direct, without any rehandling, to their customers in Britain or elsewhere, instead of having to pack them in separate containers as they had to do, up to the present."

# Transmedia storytelling in a crisis?



# Conclusions

- Sensitivity to space / time in intervention in social networking.
- Inter-disciplinary and not technology led approach.
- Mathematical modelling of scenarios / intervention strategies
- Transmedia is underexplored (social networking interacts with old media)