

CIRA: A COMPETITIVE INTELLIGENCE REFERENCE ARCHITECTURE FOR DYNAMIC SOLUTIONS

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Objective: to develop a technical reference architecture for a dynamic competitive intelligence system, which can be easily customised depending on a specific set of requirements.

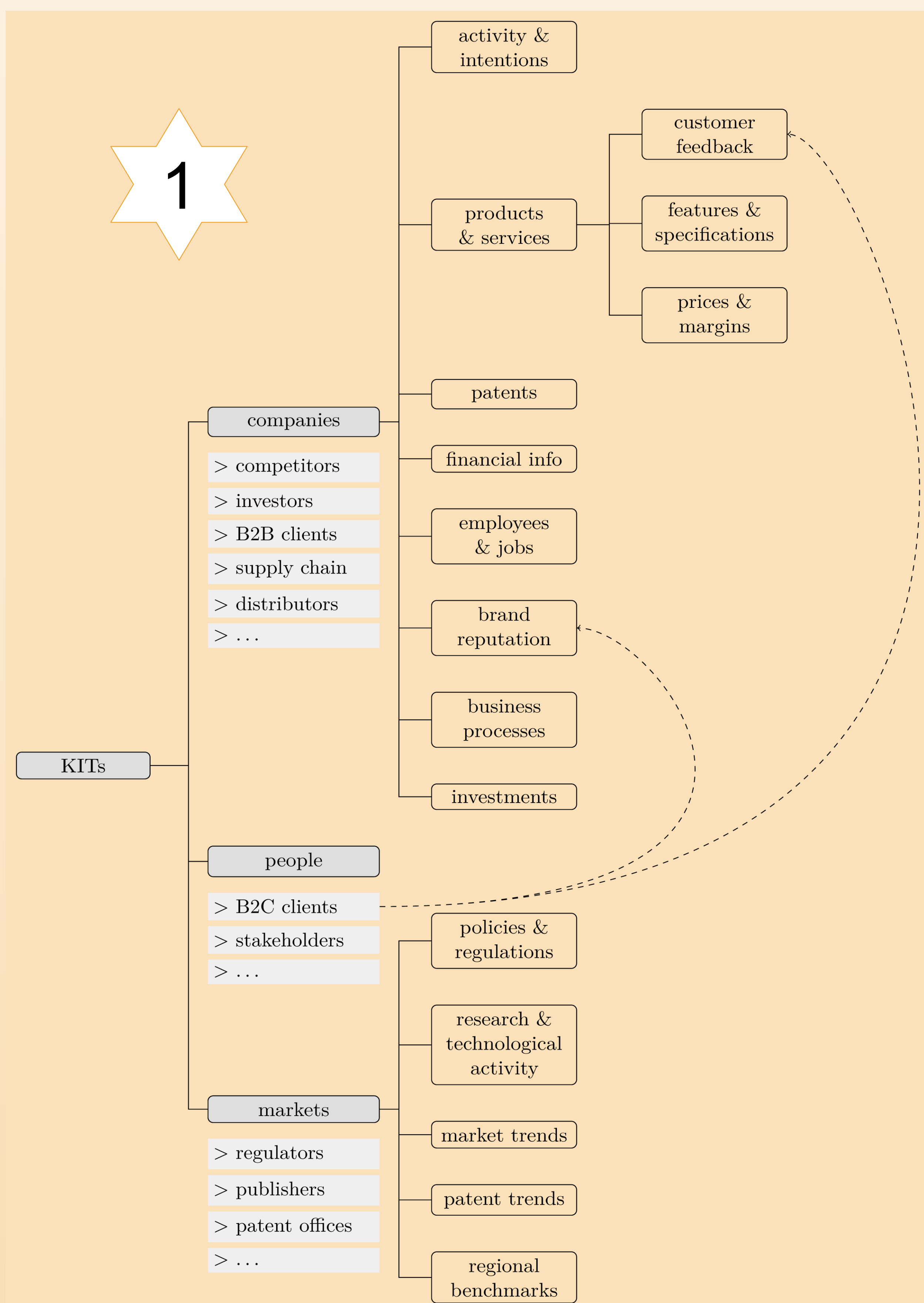


Figure 1: The Key Intelligence Topics (KITs) model.

```
{
  "lang": "english",
  "title": "Brent falls under $106",
  "url": "http://www.upstreamonline.com/live/article1355570.ece",
  "text": "Oil fell under $106 a barrel on Wednesday to a six-week low as concerns eased about [...]",
  "publish_date": "2014/03/19",
  "annotations": {
    "areas": ["Asia > Russia", "Commonwealth of Independent States > Ukraine"],
    "markets": ["Offshore Oil & Gas"],
    "orgs": ["US Federal Reserve", "American Petroleum Institute", "Energy Information Administration"],
    "people": ["Christopher Bellew", "President Vladimir Putin", "Brent"],
  }
}
```

Table 3: Example post item in our data set.

Type	Change Rule
Emerging	+0.78 ["areas", "Asia > Russia"] ⇔ ["markets", "Offshore Oil & Gas"]
Added	+0.20 ["markets", "Seagoing Transport > LNG Tanker"] ["areas", "Asia > Japan"] ⇔ ["areas", "Asia > Korea, South"]

Tables 6-7: Example rules between quarters.

CI Phase	# Functional Requirement	# Sources (e.g.)	
Extraction	1 Track changes in posts	4 (Chen et al., 2002)	
	2 Collect both structured and unstructured data	2 (Rao, 2003)	
Analysis	3 Credibility analysis	7 (Zhao and Jin, 2011)	
	4 Topic exploration	5 (Ziegler, 2012)	
	5 Document summarisation	2 (Bose, 2008)	
	6 Scenario simulation	2 (Bose, 2008)	
	7 Event deduplication	2 (Chen et al., 2002)	
	8 Integrate structured and unstructured data	2 (Fan et al., 2006b)	
	9 Product comparison	1 (Xu et al., 2011)	
	10 Predict competitor data	1 (Cobb, 2003)	
	11 Company, people and markets profiles	1 (Bose, 2008)	
	12 Multilingual support	1 (Chen et al., 2002)	
	Dissemination	13 Ad-hoc querying	8 (Mikroyannidis et al., 2006)
		14 Monitoring & alerts	5 (Fan et al., 2006b)
15 Personalised information routing		5 (Fan et al., 2006a)	
16 Information visualisation		5 (Rao, 2003)	
17 Newsletter summaries		1 (Prescott, 1995)	
18 Security policies		1 (Bose, 2008)	

Table 1: Competitive Intelligence solution requirements identified in literature.

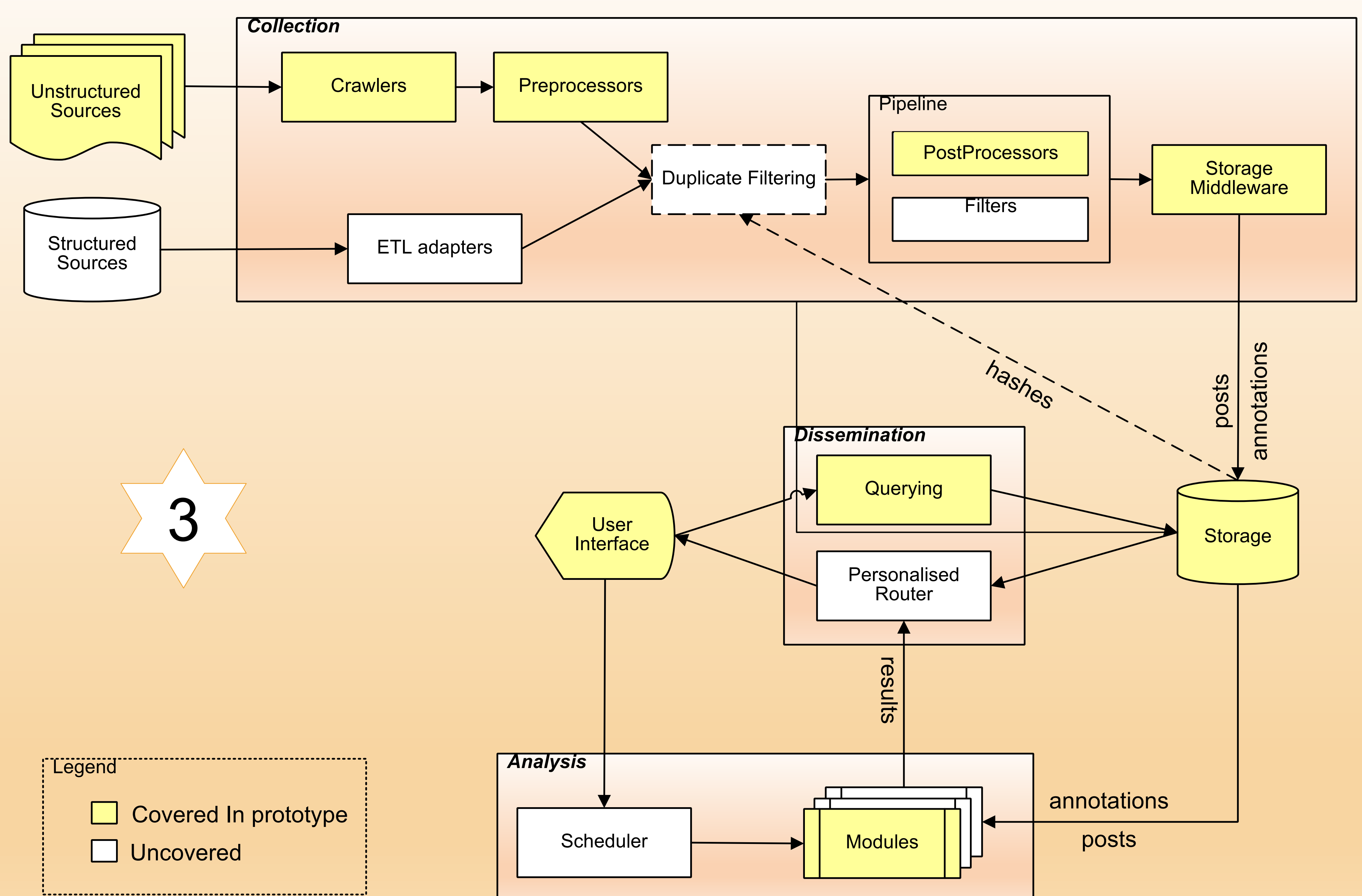


Figure 2: The Competitive Intelligence Reference Architecture (CIRA).

Conf.	Occurrence	Rule
1.0	+++++++	["areas", "Southeast Asia > Hong Kong (SAR)"] ⇔ ["markets", "Environmental Safety & Control > Search and Rescue Vessel"]
0.994	+++++++	["areas", "Southeast Asia > Hong Kong (SAR)"] ⇔ ["markets", "Defence & Security > Search and Rescue Vessel"]
0.946	+++++++	["orgs", "Daewoo"] ["orgs", "Hyundai"] ⇔ ["areas", "Asia > Korea, South"]

Table 11: Top-3 association rules of most important trends during the two year-period.