

# Wayfinding in Airports

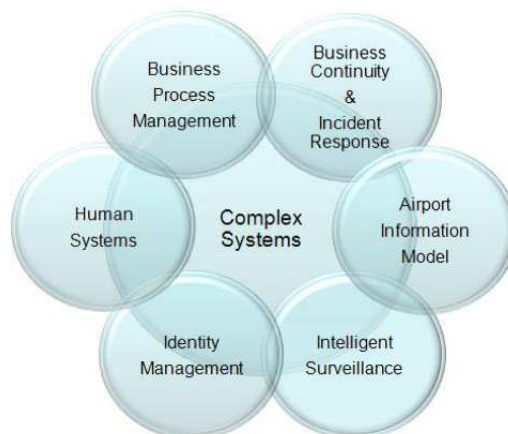
## A Bayesian Network Approach

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## Airports of the Future

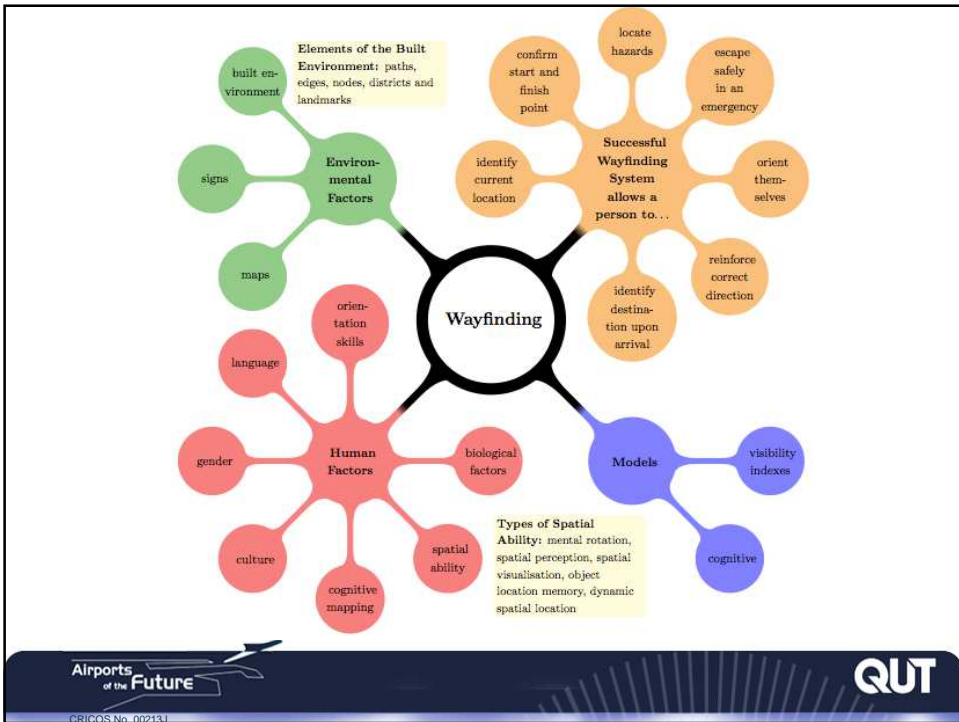
- Improve the safety, security, efficiency and passenger experience within Australian airports by developing an integrated and adaptive complex system approach for the design, management and operation of airports.



# Wayfinding

- The consistent use and organisation of sensory cues from the external environment.

Wayfinding = Decision Making + Decision Executing + Information Processing



## Why is it important?

- Increase efficiency
- Equity issues
- Reduction of passenger frustration
- Increased passenger or user satisfaction
- Cost reduction

## Current Models

- Mathematical Models
  - Braaksma et al (1980): Visibility Index (VI)
  - Tasic and Babic (1984)
  - Dada and Wirasinghe (1999)
- Cognitive Models
  - Numerous models have been proposed, but they have to distinguish between the processes of route planning and plan execution

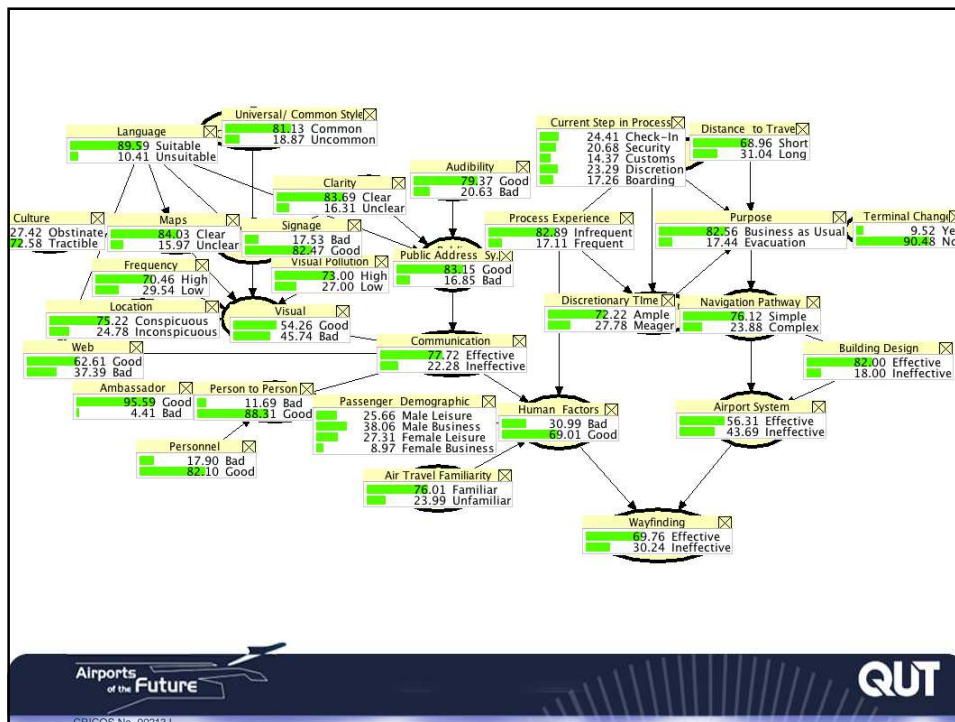
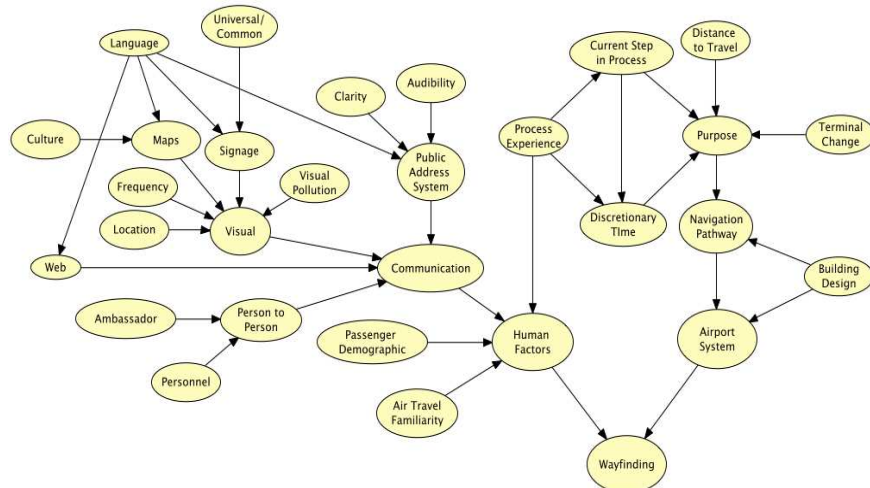
## Model Development

- Conceptual Model
  - focus group meeting
  - the composition of this group included post-doctoral fellows, postgraduate research students and senior academic staff.

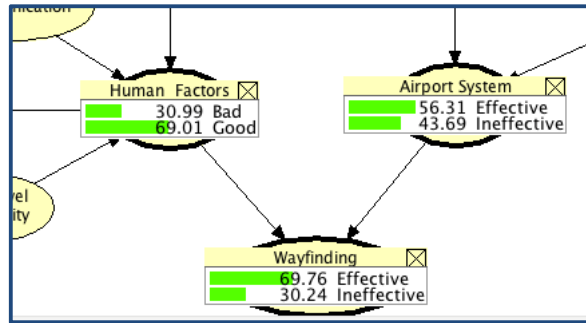
## Model Development

- BN Development
  - refinement of the conceptual model
  - assignment of states of the nodes
- Quantification
  - undertaken using a modified Delphi method

# Final Model



## Final Wayfinding Probabilities

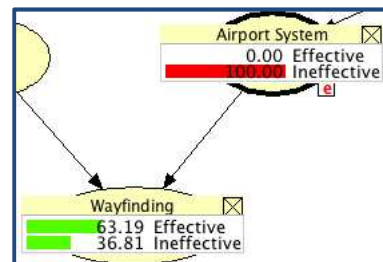
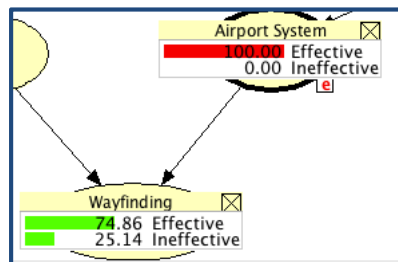


## 100% Effective/Ineffective Wayfinding

Wayfinding	Human Factors	Airport System
100% Effective	Good: 92.64% Bad: 7.63%	Effective: 60.42% Ineffective: 39.58%
100% Ineffective	Good: 85.52% Bad: 14.48%	Effective: 46.82% Ineffective: 53.18%

## Human Factor and Airport System Extremes

Internal Nodes	Influence on Wayfinding
Human Factors - 100% Good	Effective: 93.65% Ineffective: 6.35%
Human Factors - 100% Bad	Effective: 16.56% Ineffective: 83.44%



## Influences on Human Factors

- Gender: only a small difference on its effect on wayfinding
- Process Experience: the frequency of a person's experience only had a larger impact than gender wayfinding
- Communication and Air Travel Familiarity had the greatest influence on Human Factors

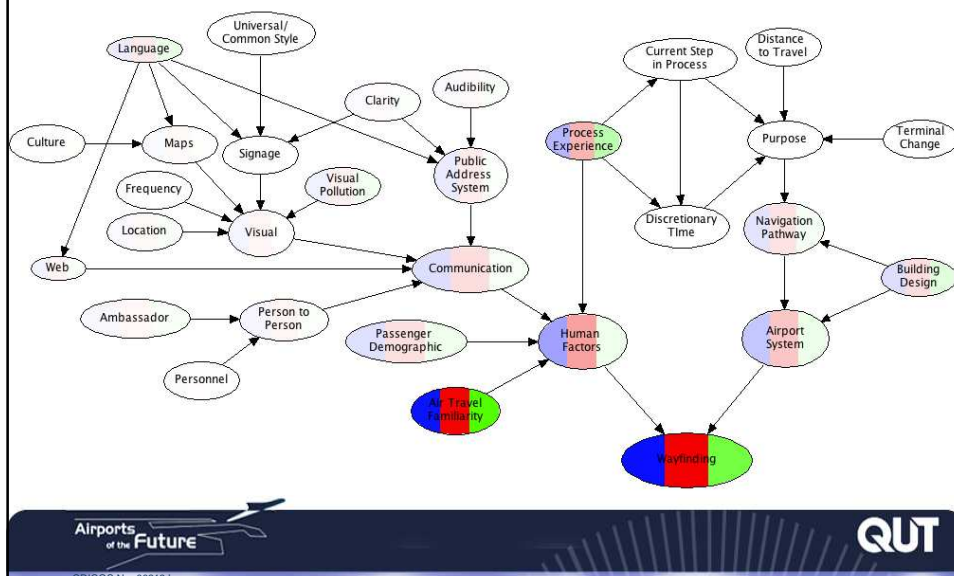
## Influences on the Airport System

- Both Navigation Pathway and Building Design have a large impact on the Airport System

Factor	Airport System	Wayfinding
Navigation Pathway (Simple)	Effective: 69.08%	Effective: 71.25%
	Ineffective: 30.92%	Ineffective: 28.75%
Navigation Pathway (Complex)	Effective: 15.62%	Effective: 65.02%
	Ineffective: 84.38%	Ineffective: 34.98%
Building Design (Effective)	Effective: 64.13%	Effective: 70.67%
	Ineffective: 35.87%	Ineffective: 29.33%
Building Design (Ineffective)	Effective: 20.69%	Effective: 65.61%
	Ineffective: 79.31%	Ineffective: 34.39%



## Sensitivity Analysis





## Conclusion

- Wayfinding is an interplay between human and environmental factors
- Human Factors play a larger role in effective wayfinding
- Building design and navigation pathway greatly impact the Airport System

## Further Work

- Sensitivity analysis completion
- Development of an OOBN
  - More accurate and robust representation of Wayfinding
  - Inclusion of more details for Human Factors
  - Combination of the current model (formed through workshop) with information from literature

## References

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