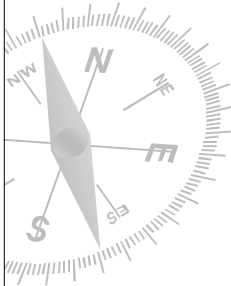


Monet Roadmap

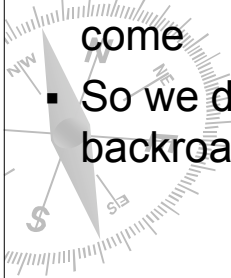
Where does the future lead?

Chris Price
UW Aberystwyth



Why do we want a roadmap for qualitative reasoning?

- So we know where we want to go
- So we can identify what research is important to get there
- So we can appreciate how far we have come
- So we don't waste too much time on backroads



How did we go about generating a QR roadmap in Monet 2?

- We looked at previous one (Monet 1)
 - Very technology oriented
 - Very positive – dates for when things will happen
 - Very wrong (on dates at least)
- We focused on task groups (automotive, diagnosis, education, biomedical)
- We got people together for a week
 - considered task group areas (relevant technology drivers)
 - considered technology needed
- Looked at a (vague) ten year period

Structure of this talk – it matches the process carried out

- Task group areas
 - Automotive
 - Diagnosis
 - Education
 - Biomedical
- Technological Issues

Automotive roadmap

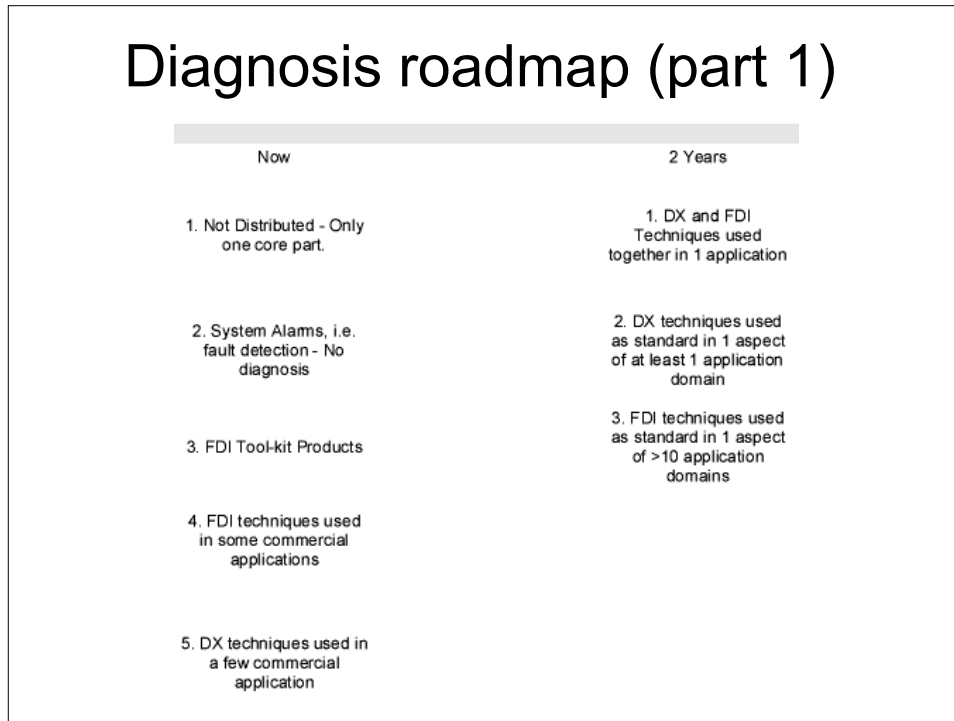
	Now	2 Years	5 Years	10 Years	
Products	diagnosability tools	automatic generation of garage based diagnostics	knowledge management of model libraries	World model-based vehicle efficiency (e.g. gear shift with terrain knowledge)	distributed diagnostic systems (localised intelligence)
	FMEA	automatic generation of off board diagnosis	MBS Shell	automatic generation of emission reduction systems	robot diagnostician -->
	SCA	integration of models over lifecycle of vehicle	software verification	monitoring tools for efficiency and lower emissions	vehicle personalisation tools -->

	Now	2 Years
Products	diagnosability tools	automatic generation of garage based diagnostics
	FMEA	automatic generation of off board diagnosis
	SCA	integration of models over lifecycle of vehicle

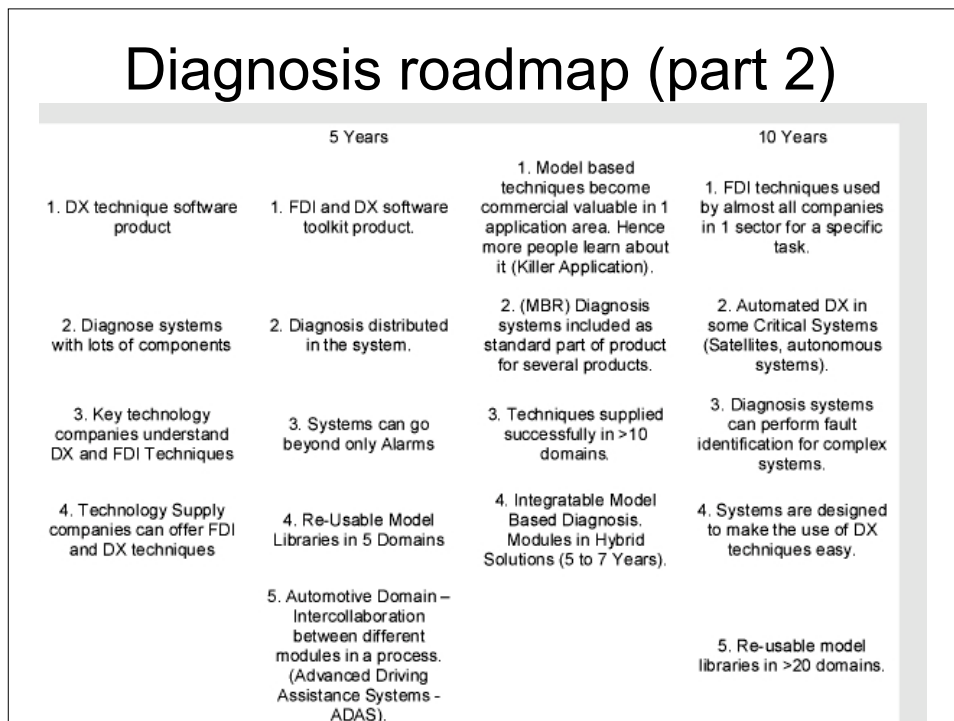
5 Years		
<p>knowledge management of model libraries</p> <p>MBS Shell</p> <p>monitoring tools for efficiency and lower emissions</p>	<p>on board repair - better fault mitigation</p>	<p>World model-based vehicle efficiency (e.g. gear shift with terrain knowledge)</p> <p>automatic generation of emission reduction systems</p>

10 Years	
<p>World model-based vehicle efficiency (e.g. gear shift with terrain knowledge)</p> <p>automatic generation of emission reduction systems</p>	<p>distributed diagnostic systems (localised intelligence)</p> <p>robot diagnostician --></p> <p>vehicle personalisation tools --></p>

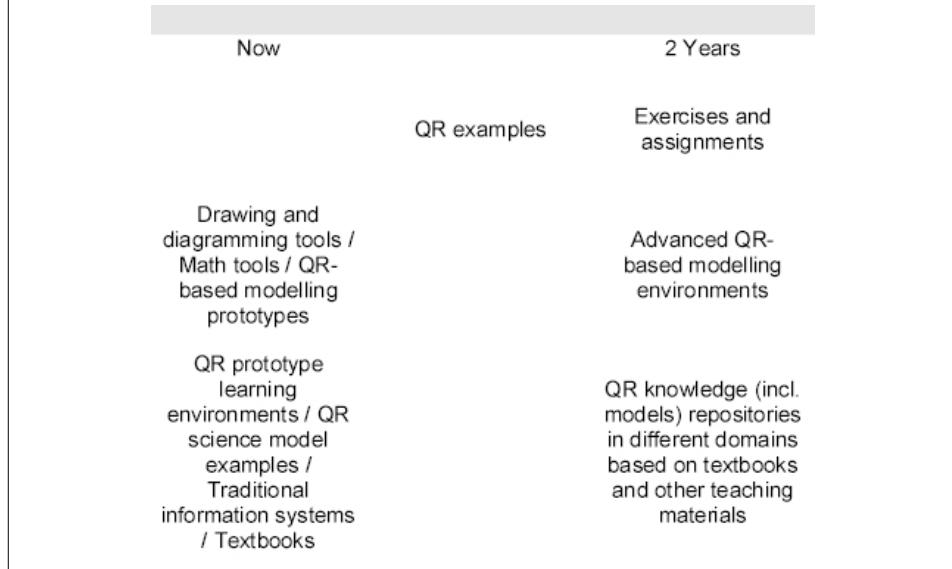
Diagnosis roadmap (part 1)



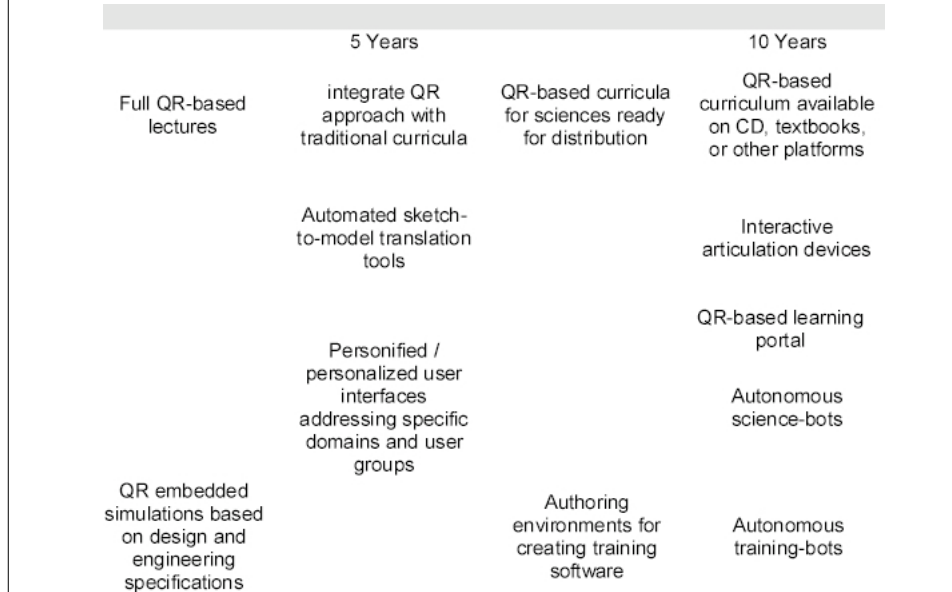
Diagnosis roadmap (part 2)



Education roadmap (1)



Education roadmap (2)



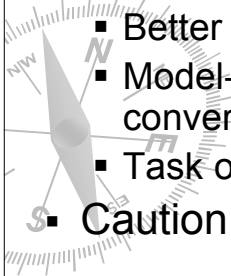
Biomedical roadmap

- Roadmap less well developed than the others
- Perhaps because biomedical QR field less developed
- Doesn't really cover new QR-based tools to be expected over next ten years
- Worries a lot more about soft issues



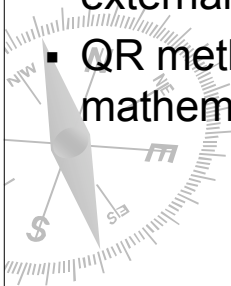
Technological issues

- Noted in each individual roadmap
- Combined / extended
- Added issues from other domains
- Classified into areas
 - Better modelling
 - Model-based engineering (generation, conversion, management, standards)
 - Task oriented challenges
- Caution - this is the edited highlights



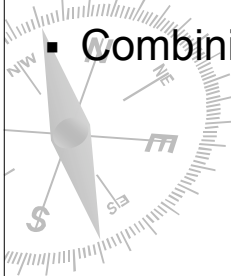
Better Modelling - Improved Ontologies

- Models of complex systems
- Models of software
- Modelling the user, the organisation, the external world
- QR methods using more sophisticated mathematics



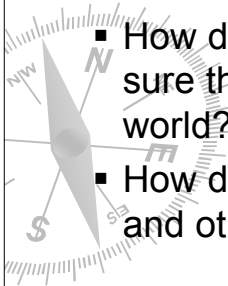
Better Modelling - Model Integration

- Hybrid modelling
- Integration of models from different domains: electrical, mechanical, hydraulic, etc.
- Multi-level modelling
- Combining qualitative and functional models



Model-based Engineering

- Making real applications involves real world issues
 - Where do I get my models from? (generation)
 - Can I use existing models? (conversion)
 - How do I track changes to my models and make sure that they are available and match the real world? (model management)
 - How do I share models with other companies and other tools (modelling standards)



Summary

- Plenty of challenges out there for QR researchers
- Roadmaps are on Monet website and on Summer School CD
- Do use them in choosing and doing your research
- Questions?

