

FINAL PRESENTATION

– „Dumping to gather“ –

Marc Schmidt

Josephine Krause

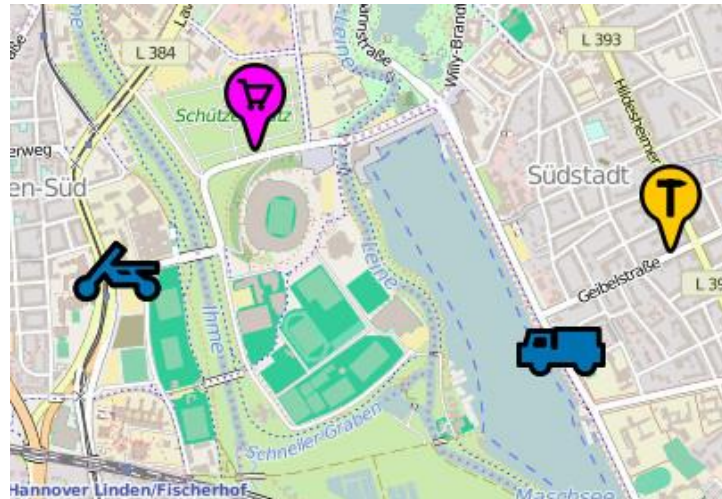
Muzammal Hussain

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1. General Introduction and Motivation

- All Terrain Planetary Vehicles could be used to solve water crisis on mars and earth
- **Two teams:** Agents moving in the city
- **Goal:** Build and keep wells in order to earn points



<https://multiagentcontest.org/>




2. Description of the final team strategy

Category		Milestone strategy	Final strategy
Exploration		<ul style="list-style-type: none"> Grid exploration 	<ul style="list-style-type: none"> Grid exploration
Defining roles		<ul style="list-style-type: none"> Drones: exploration and well-building Trucks: Resource gathering 	<ul style="list-style-type: none"> Exploration and resource gathering is done by all agents
Sharing information		<ul style="list-style-type: none"> Items, Facilities, Wells, Agents 	<ul style="list-style-type: none"> Items, Facilities, Wells, Agents, visited grid points
Massium		<ul style="list-style-type: none"> Consideration of ongoing investments 	<ul style="list-style-type: none"> Spend Massiums on demand
Items		<ul style="list-style-type: none"> Hoard items in trucks No assembly in advance 	<ul style="list-style-type: none"> Gathering items is done on demand for the jobs

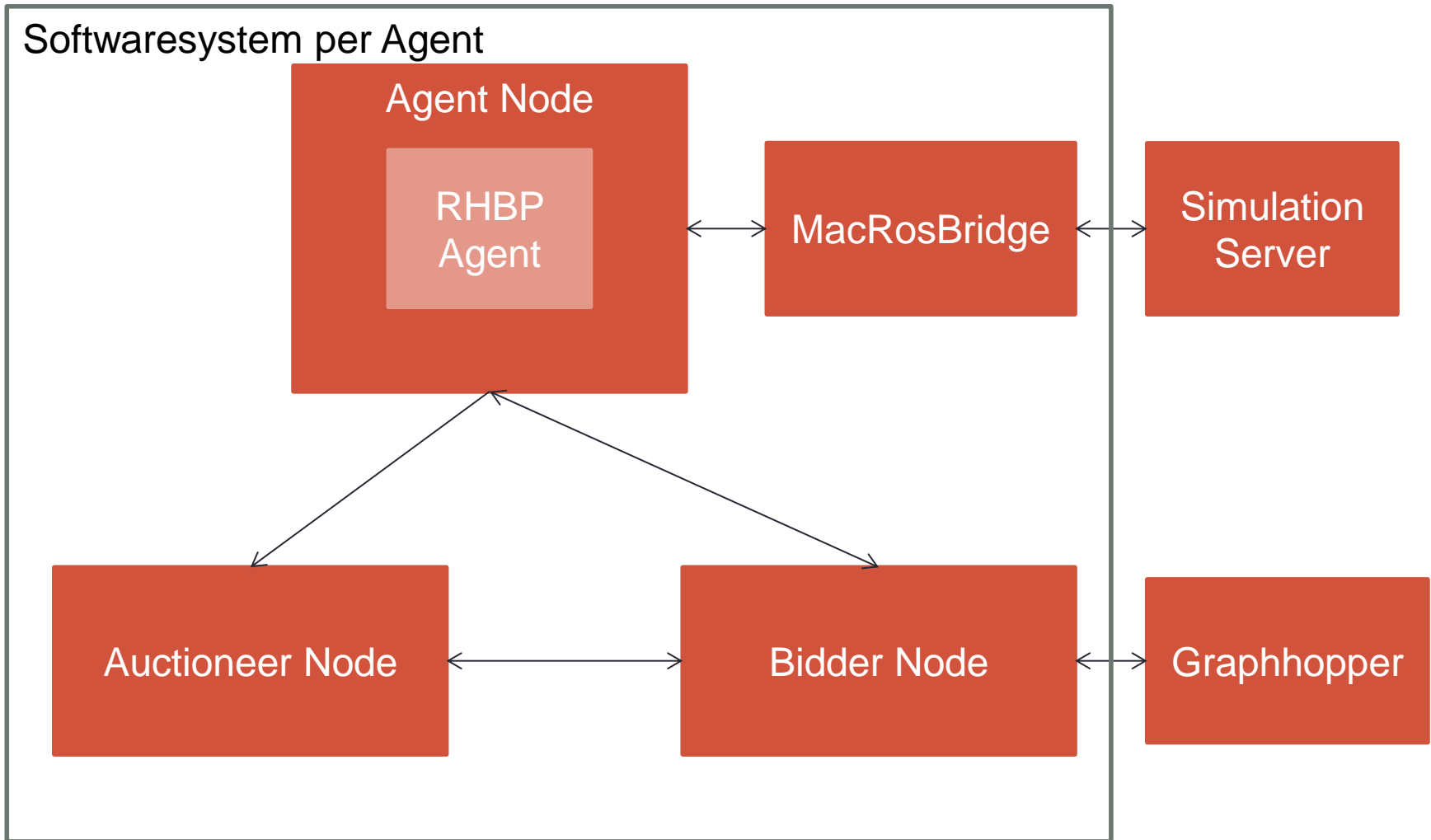
2. Description of the final team strategy

Category		Milestone strategy	Final strategy
Jobs		<ul style="list-style-type: none"> • Cost-benefit calculation • Decomposition of jobs • Abortion of jobs if necessary 	<ul style="list-style-type: none"> • Do every kind of job except for auction jobs • Decomposition of jobs • If job cannot be finished: finish job in corresponding store to empty the load
Auctioning		<ul style="list-style-type: none"> • Auction in stages • Auction of tasks • Receiving of plans • Reasoned decision 	<ul style="list-style-type: none"> • Auction in stages • Auction of tasks • Receiving of plans • Reasoned decision
Charging		<ul style="list-style-type: none"> • Depending on the mode (idle time or execution) 	<ul style="list-style-type: none"> • Depending on the mode
Idle time		<ul style="list-style-type: none"> • Priorities in idle time 	<ul style="list-style-type: none"> • Priorities in idle time

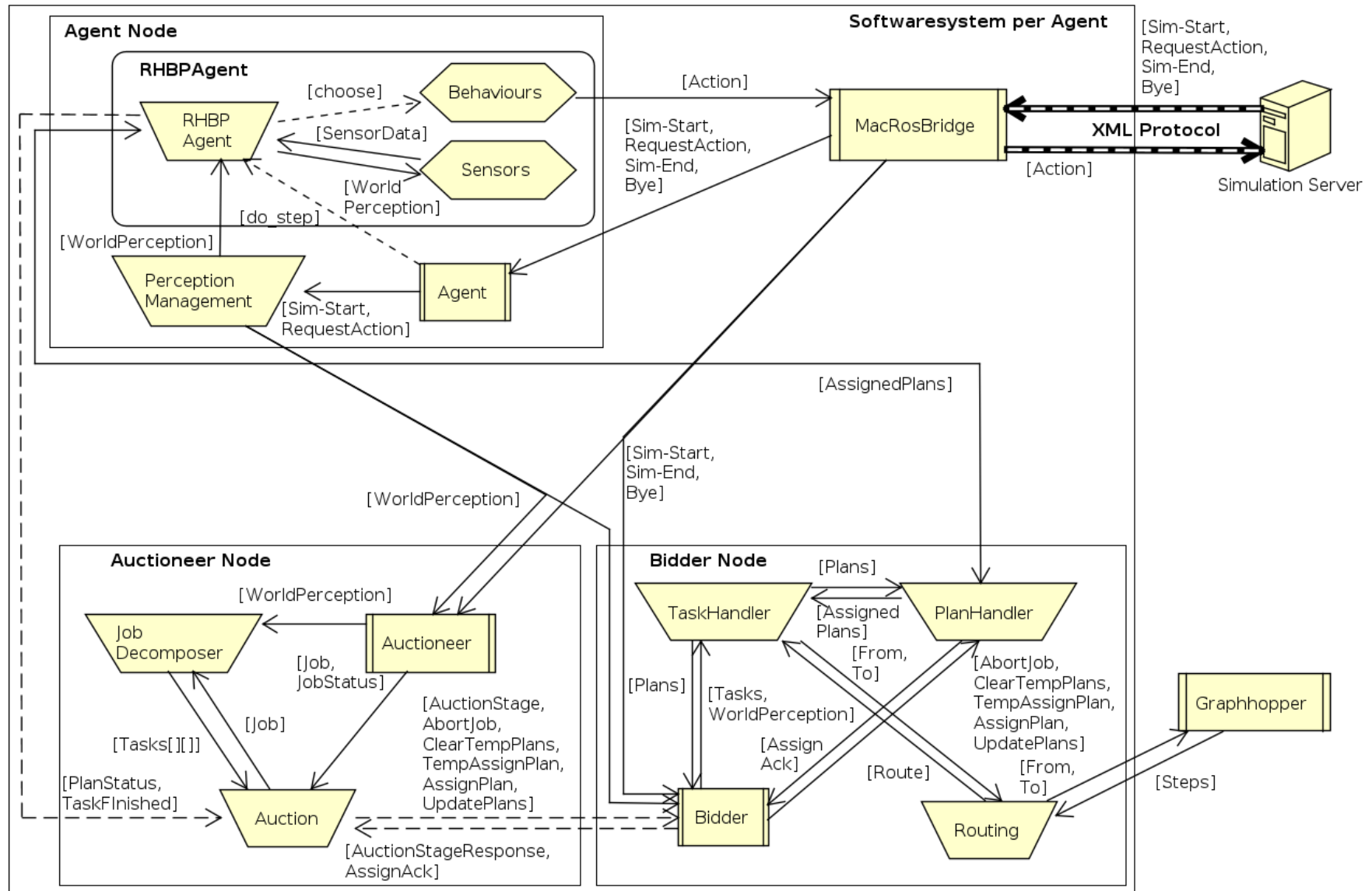
2. Description of the final team strategy

Category		Milestone strategy	Final strategy
Upgrades		<ul style="list-style-type: none">• Perform upgrades depending on the type of agent	<ul style="list-style-type: none">• Not realized yet
Wells		<ul style="list-style-type: none">• Placing wells on the border of the map	<ul style="list-style-type: none">• Placing wells on places the trucks have been before• One well at a time
Failure		<ul style="list-style-type: none">• Update plan and inform auctioneer	<ul style="list-style-type: none">• In exploration: choose another grid point

3. Description of the final approach



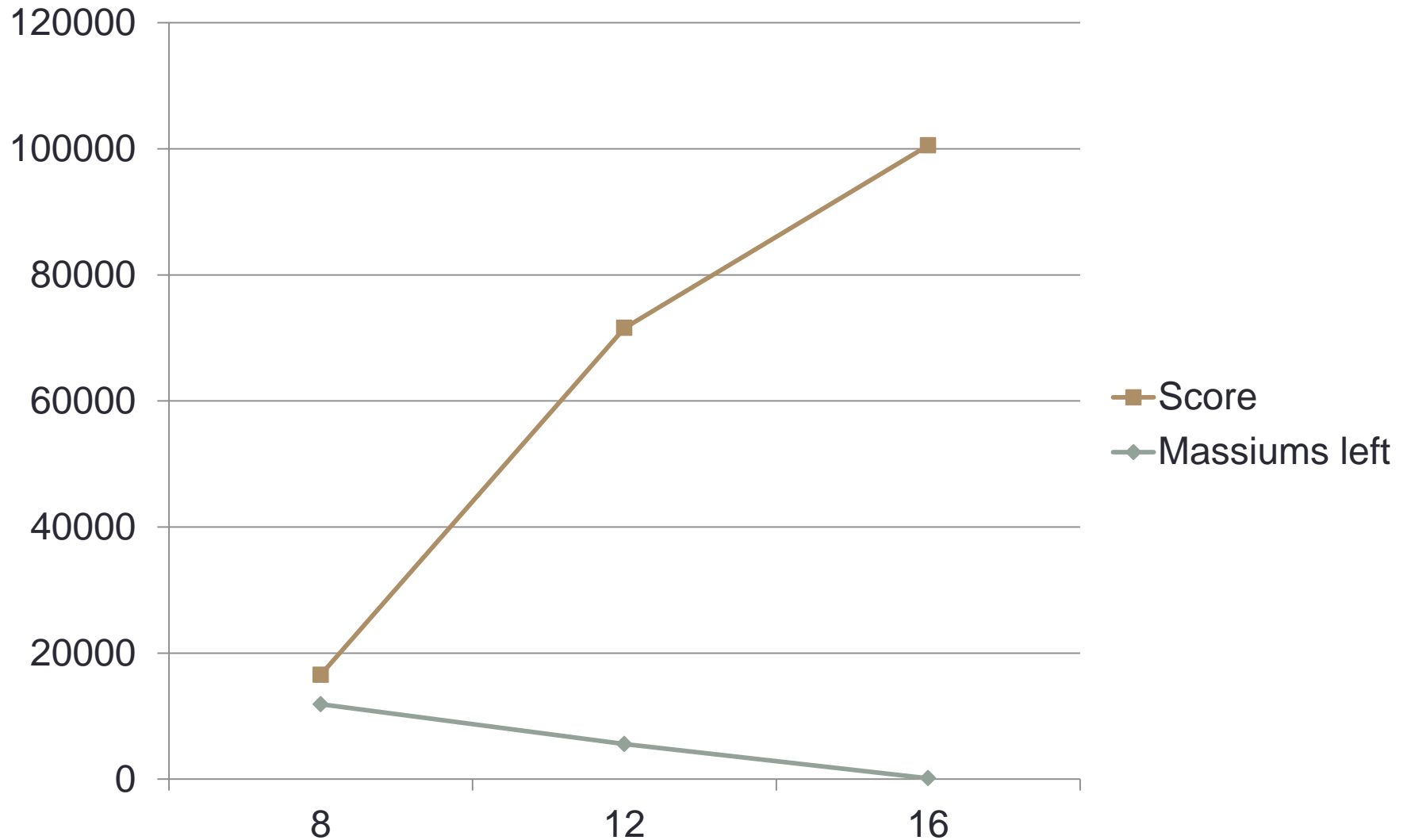
System Architecture & Data Flow



4. Evaluation – Evaluation Approach

- 3 simulations with different amounts of agents: 8, 12, 16
- Aspects:
 - Success (Score, Massiums left)
 - Performance (Action Response Duration, Decision Making Timeout, Auction Stage Response Duration)
 - Jobs (Jobs done, Jobs failed)
 - Wells (Amount, Costs)

4. Evaluation - Success



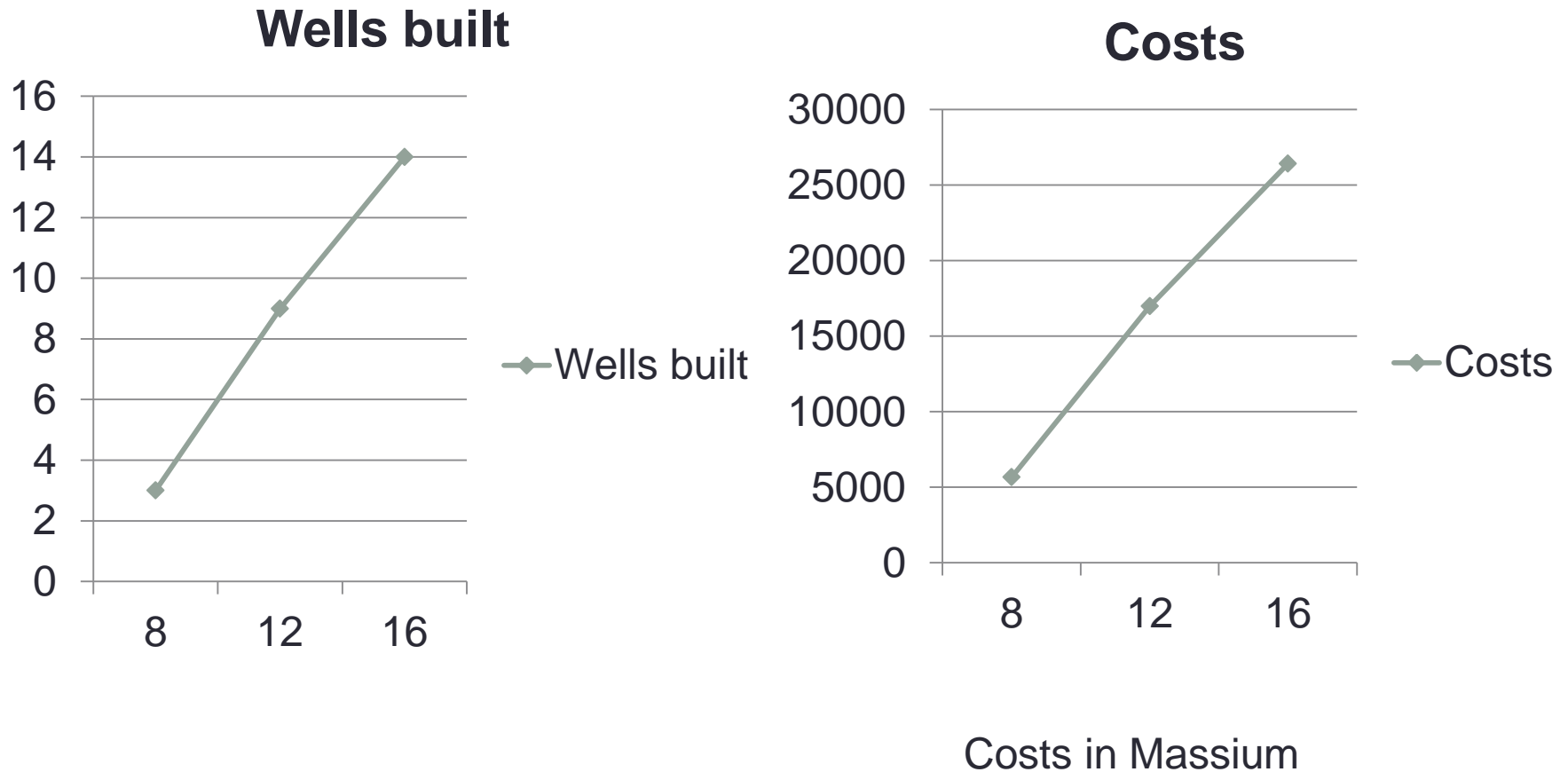
4. Evaluation – Performance

Metric	8 agents	12 agents	16 agents
Mean Action Response Duration in s	0,84818	1,17333	1,64032
Mean Decision Making Timeouts per agent	2	9	41
Percentage Decision Making Timeout Steps	0,002	0,00901	0,04104
Mean Auction Stage Response Duration in s	0,06623	0,07912	0,10305

4. Evaluation – Jobs



4. Evaluation – Wells



5. Team Structure

Josephine Krause

Group coordinator

Main responsibilities:

- Monitoring of progress and issues concerning programming and documentation tasks
- Preparation of the weekly progress

Marc Schmidt

Head of programming

Main responsibilities:

- Having the authority over decisions concerning the programming
- Look into the changes made in the code by the other group members and point out if something is still improvable

Muzammal Hussain

Scientist

Main responsibilities:

- Do research if necessary so all decisions can be made reasonably

Thank you for the attention

References and Acknowledgements

- Icons made by Smartline, DinosoftLabs, Smashicons, Freepik, Vectors Market and Maxim Basinski from www.flaticon.com
- <https://multiagentcontest.org/>
- Smith, R.G.: The Contract Net Protocol: High-Level Communication and Control in a Distributed Problem Solver. IEEE Trans. on Computers C-29(12):1104-1113.