



# Archinotes: A Global Agile Architecture Design Tool

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# About Us....

## Darío Correal, Ph.D

- Assistant Professor
- Research interests
  - Software Architecture
  - Solution Architecture
  - Agile software development



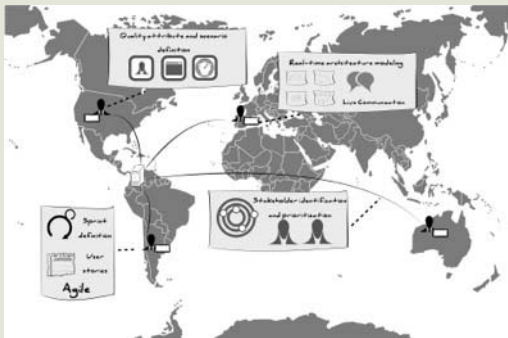
## Juan Urrego, M.S.

- Instructor
- Research interests
  - Software Architecture
  - Solution Architecture
  - Agile software development
  - User eXperience

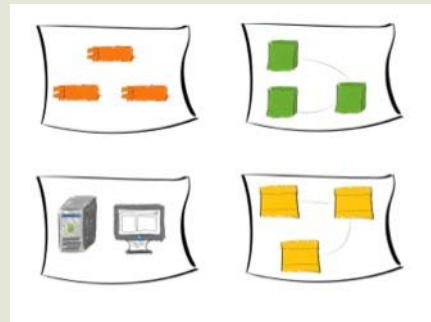


# What is this presentation about?

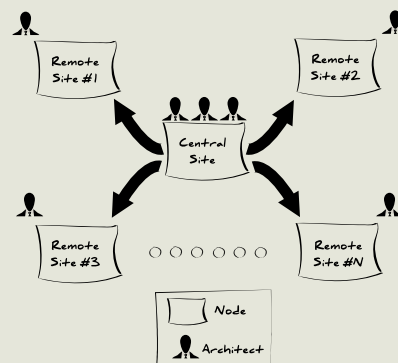
## Software Architecture Design !!!



## Global Software Development (GSD)



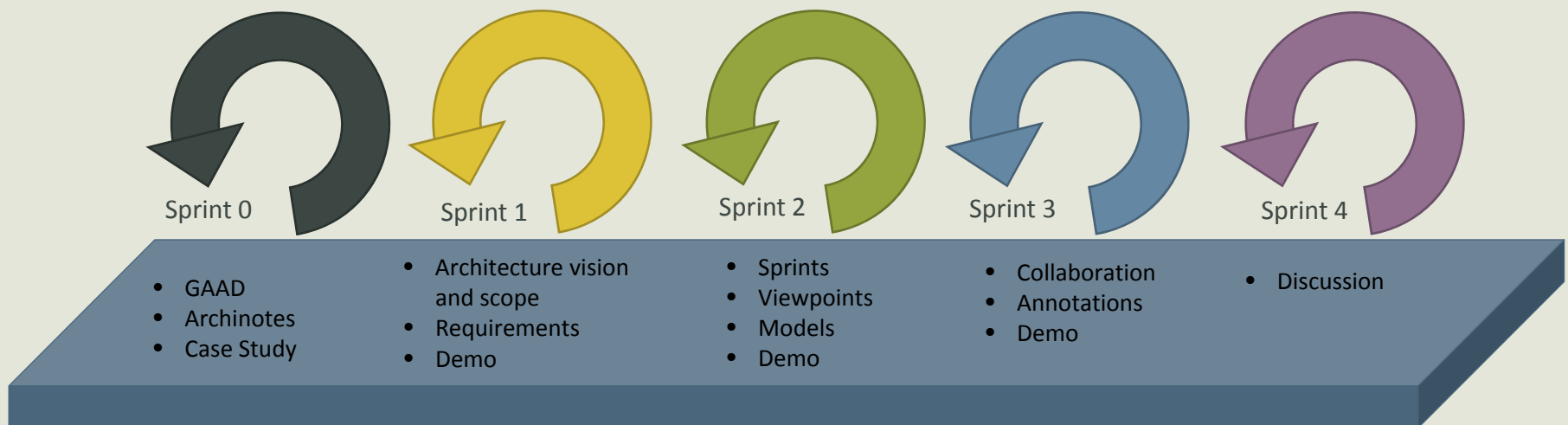
## Agility



## Collaboration

# How is this presentation structured?

Each sprint: 4-5 minutes





# What is this sprint about?



Global Agile Architecture Design (GAAD)

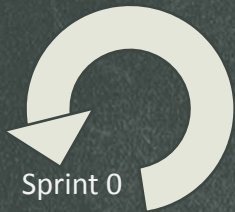


Archinotes: A GAAD Supporting Tool



Experience report using Archinotes





# Global Agile Architecture Design (GAAD)

Software architecture projects requires multiple participants

- Geographically distributed
- Working at different time zones
- Use of heterogeneous tools to support collaborative work





# Global Agile Architecture Design (GAAD)

**Software architecture projects requires multiple participants**

We develop a small study to understand offer and demand patterns:

- Source: monster site
- 20 different countries
- 8 languages
- 3,386 cities
- Different architecture roles (infrastructure, software, SOA, information, solution)



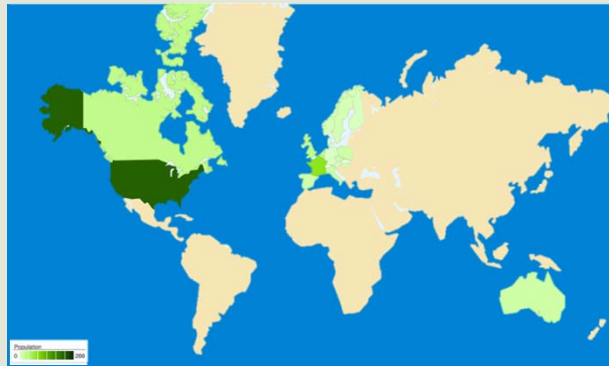


# Global Agile Architecture Design (GAAD)

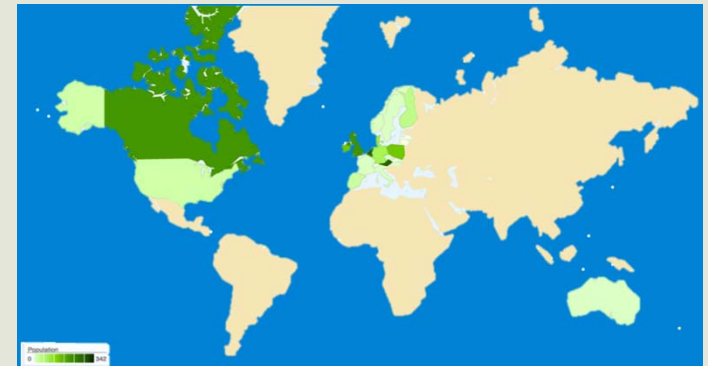
**Offer**

Infrastructure Architect

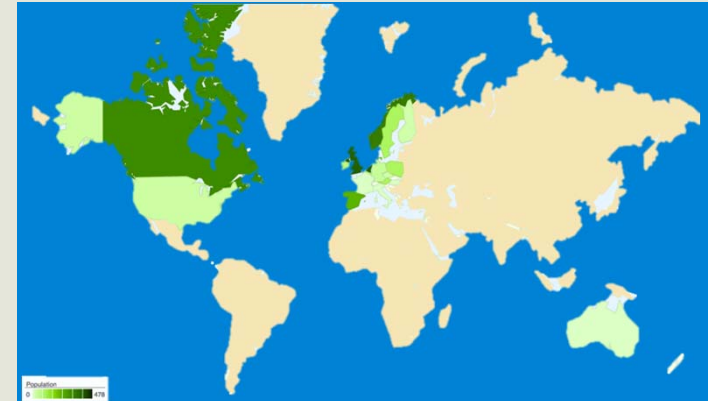
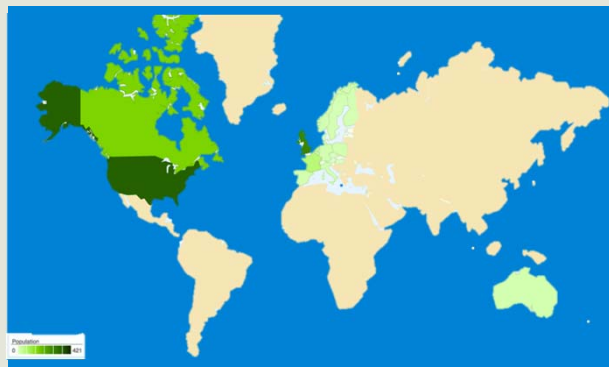
**Demand**



The offer and demand are inverse



SOA Architect







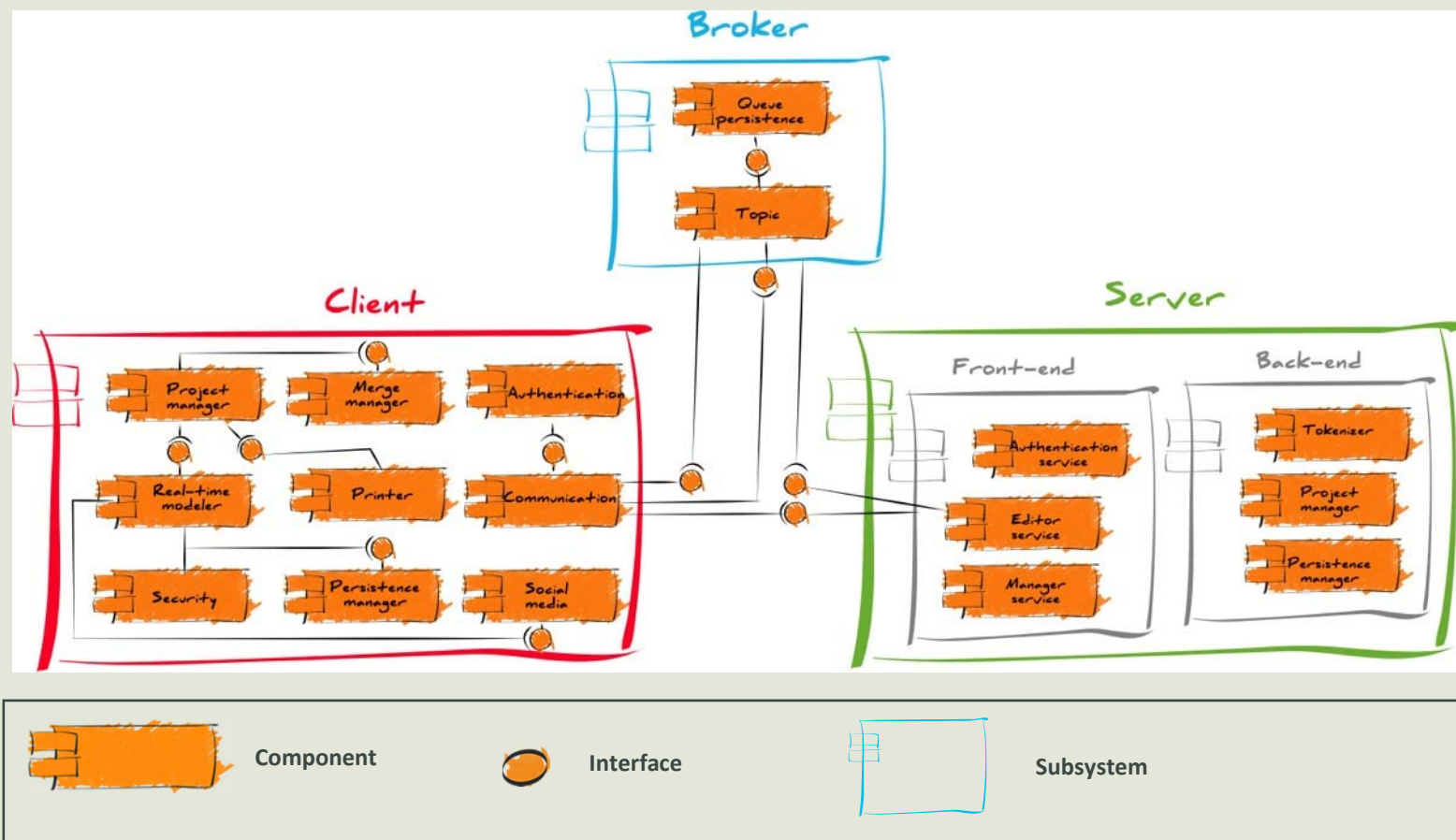
# Archinotes

Archinotes : A Global Agile Architecture Design tool

- Supports geographically distributed teams
- Provides a collaboration tool for architects
- Facilitates the generation of the Software Architecture Document
- Archinotes is based on some agile principles
  - Architecture design following *sprints* and *backlogs*
  - Explicitly use of the Architecture owner role
  - Promotes time framed review meetings : Daily architecture reviews



# Archinotes – Architecture General View

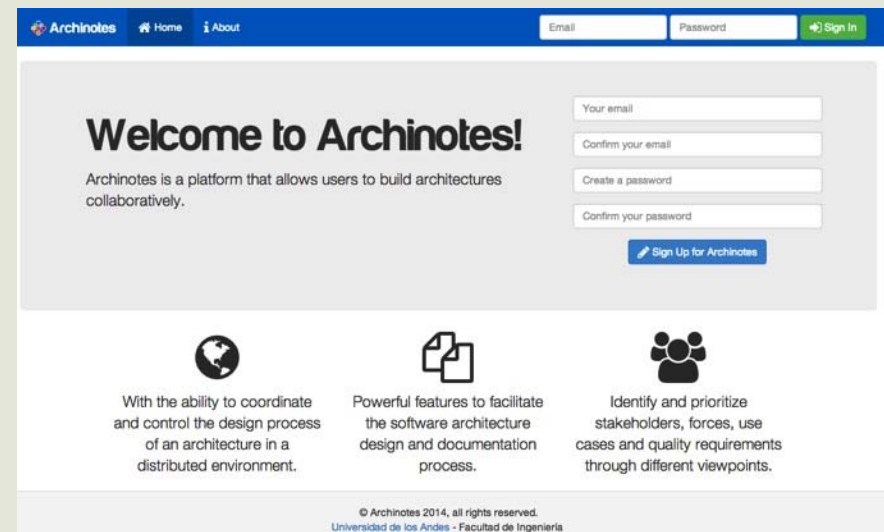




# Archinotes - Architecture

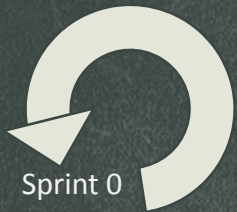


Mobile client (Android)



Web client





# Experience using Archinotes

## Academic Experience

- Design tool for the software architecture course
  - undergraduate program on Systems and computing engineering
  - Los Andes University – Bogotá -Colombia
- Fall 2013 and Spring 2014
- Collaboration tool for 30 students / semester
- Medium size project
- 5 Sprints during the semester







# Experience using Archinotes

## Industrial Experience

- Public university in Cartagena – Colombia
- Development team and infrastructure architect located at Cartagena
- Software architecture team located at Bogotá
- 4 months project
- Interaction with an agile development team following Discipline Agile Delivery (DAD)
- Software architecture designed in 5 Sprints



# What is this sprint about?

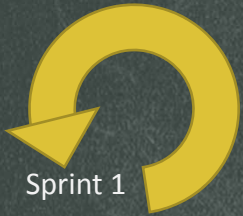


Defining architecture vision and scope



Managing architecture requirements





# Architecture vision and scope

Archinotes supports the definition of the following information about a software architecture project



Project background, purpose, scope and general overview of the systems capabilities

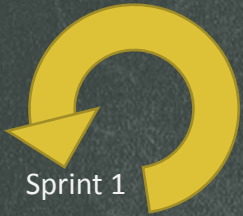


Stakeholders management (classification, main concerns)



Definition of business goals and architectural drivers





# Architecture vision and scope

Archinotes supports the definition of the following information about a software architecture project



Definition of business and technology constraints



Definition of functional requirements using operational scenarios.



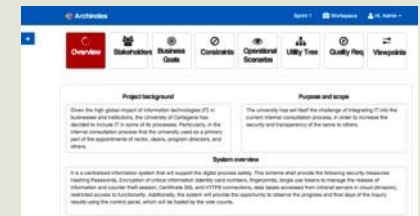




# Experience Report

## Demo


- During Sprint 0 Archinotes was used to define:
  - Architecture overview and project overview
  - 8 Business Goals
  - 10 Operational Scenarios
  - 8 Business and Technical constraints




# What is this sprint about?

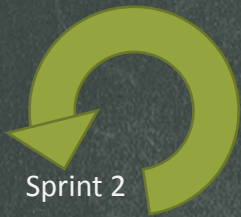


 Architecture backlog / Architecture Sprint backlog

 Designing the architecture with sprints

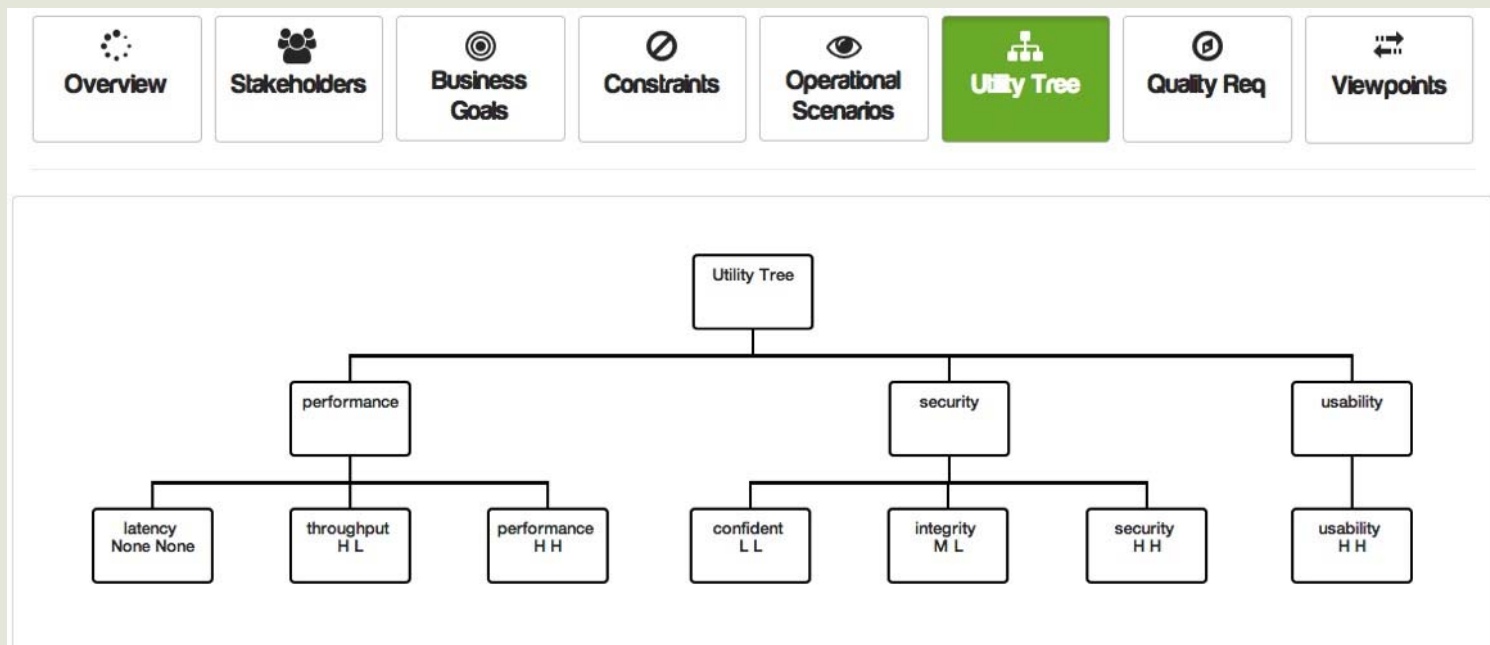
 Managing Viewpoints and architectural models

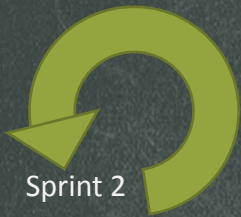




# Architecture backlog / Sprint backlog

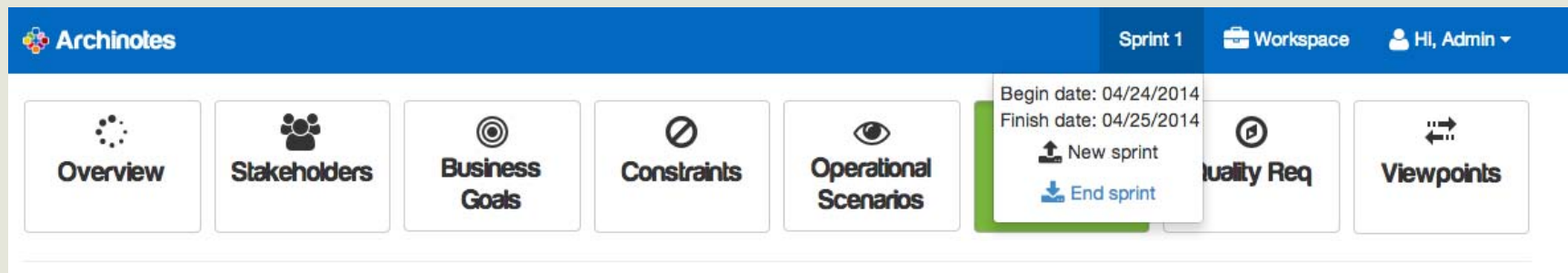
Similar to some agile development methodologies, Archinotes supports the definition of a list of requirements to be considered during the design process. Requirements defined in utility trees are used as architecture backlog items.



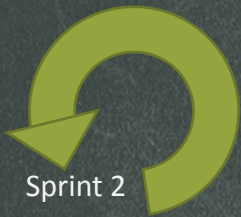


# Putting into practice agility: Sprints

Archinotes supports the definition of working sprints. Sprints can be used to design a software architecture following an incremental approximation.







# Architecture backlog / Sprint backlog

A set of quality attributes are taken from the utility tree and expanded as quality scenarios.

The screenshot shows the Archinotes web application interface. The top navigation bar is blue with the 'Archinotes' logo on the left and 'Sprint 1', 'Workspace', and a user profile 'Hi, Admin' on the right. Below the navigation bar is a row of eight icons representing different views: Overview, Stakeholders, Business Goals, Constraints, Operational Scenarios, Utility Tree, Quality Req (highlighted in purple), and Viewpoints. The main content area is divided into two sections: 'Quality Attributes' on the left and 'Quality Scenarios' on the right. The 'Quality Attributes' section contains a table with five rows of attributes and their levels. The 'Quality Scenarios' section shows a 'Latency scenario' with a dropdown for 'Sprint 0'. It contains six colored boxes: 'Source' (orange) with a dropdown set to 'Voters', 'Artifact' (blue) with a text input, 'Response' (red) with a text input, 'Stimulus' (yellow) with a text input, 'Environment' (green) with a text input, and 'Response Measure' (pink) with a text input. A green 'Save' button is located below these boxes.

performance / latency	
Medium	Low

usability / usability	
Hight	Hight

security / integrity	
Medium	Low

security / confident	
Low	Low

performance / throughput	
Hight	Low

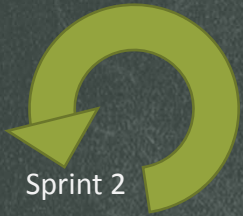
Latency scenario Sprint 0

**Source** (Voters) **Artifact** **Response**

**Stimulus** **Environment** **Response Measure**

**Save**





# Managing Viewpoints

During each sprint, the team can create architectural models associated to viewpoints. Archinotes supports most of the viewpoints proposed by Rozanski and Woods in the book “Software Systems Architecture”.



**Context**



**Functional**



**Deployment**



**Information**

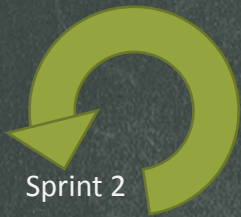


**Concurrency**



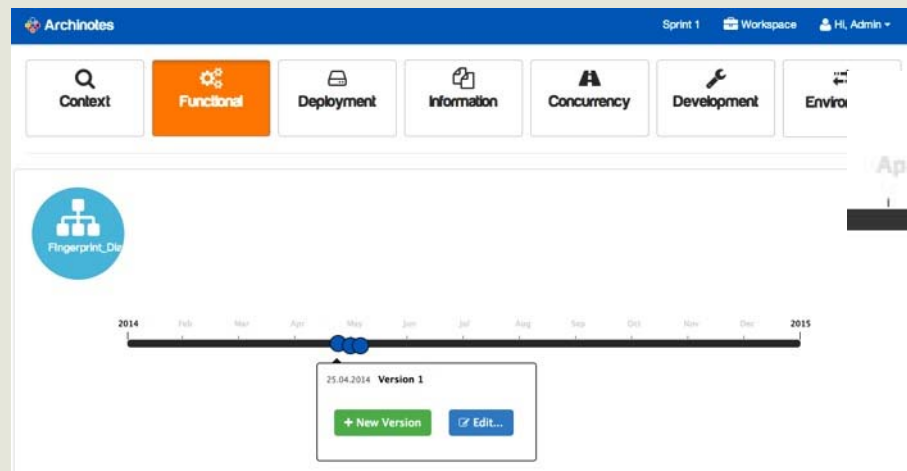
**Development**

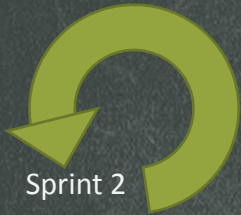




# Managing Viewpoints

Architectural models can be edited or versioned by the architecture team.





# Experience Report

- During Sprint 0, an utility tree with 8 quality requirements was defined.

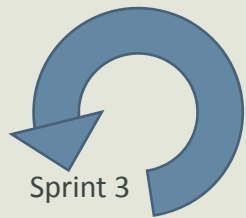
Sprint	# Quality Scenarios	# New Models	# Versions
Sprint 1	3	5	4
Sprint 2	2	2	5
Sprint 3	3	0	3
Sprint 4	0	0	4

## Demo





# What is this sprint about?

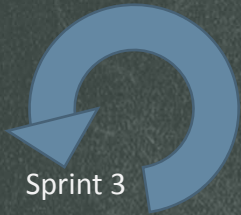


Synchronous collaboration



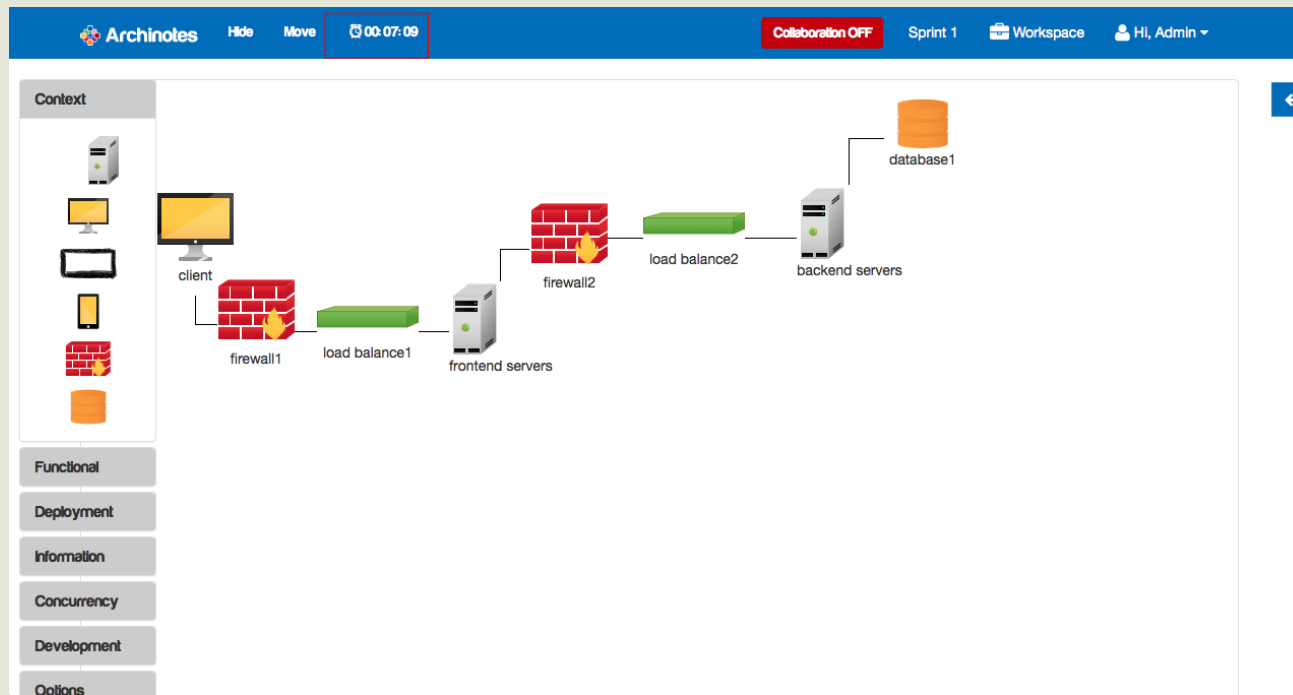
Asynchronous collaboration

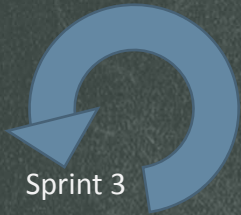




# Synchronous collaboration

Archinotes supports daily architecture reviews (DAR). DARs are time framed sessions closed invited participants.



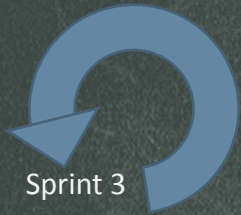


# Asynchronous collaboration

Archinotes supports asynchronous collaboration by means of annotations associated to architectural models. Annotations can be of different types: Text, audio, images, quality scenarios or custom.

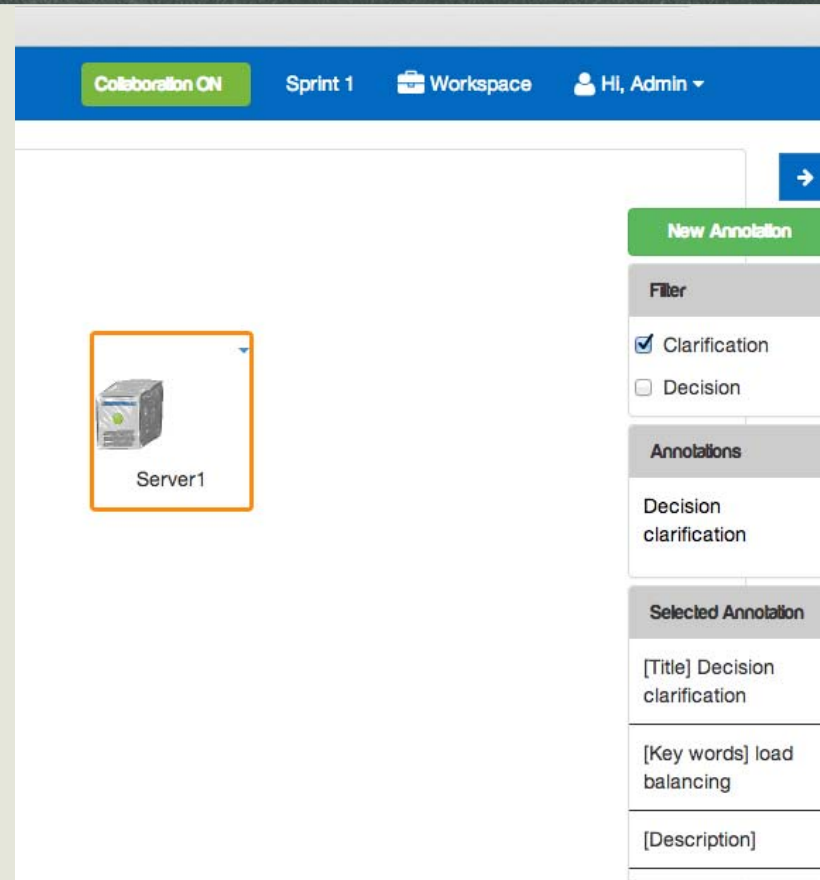
The screenshot displays the Archinotes web application interface. At the top, a blue header bar contains the Archinotes logo, a 'Workspace' button, and a user profile dropdown for 'HI, Admin'. Below the header, the 'Collaboration Settings' page is visible. It features a section for managing annotation types, with icons for Opinion, Clarification, Decision, Disagreement, and General. A 'New Annotation' dialog box is open in the foreground, showing a dropdown menu with 'Select one...' and buttons for 'Close' and 'Save changes'. In the background, the 'Collaboration Settings' page shows a form for selecting an annotation type (currently 'Opinion') and a description field. To the right, there are input fields for 'Input name' and 'Input type' for each selected type.

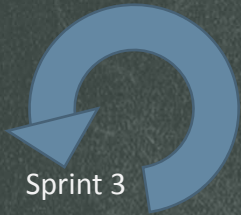




# Asynchronous collaboration

Architects can filter annotations stored in the models to read or listen about design decisions and reasoning information.





# Experience Report

- During Sprint 0, an utility tree with 8 quality requirements was defined.

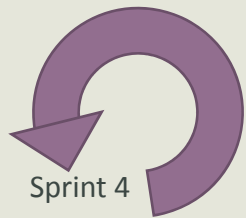
Sprint	# Architecture Reviews	# Total Annotations	# Average annotations per viewpoint
Sprint 0	5	4	0,8
Sprint 1	4	8	1,6
Sprint 2	6	10	1,6
Sprint 3	3	18	3
Sprint 4	2	25	4,16

## Demo






# What is this sprint about?

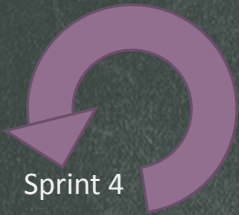


 Conclusions

 Future work

 Working with Archinotes

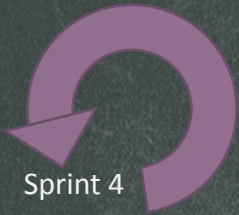




# Conclusions

- Archinotes has proven to be effective as a collaboration tool for distributed teams, supporting daily meetings and annotations
- Promising results after combining agile principles and Software Architecture in small to medium size projects
- At the academic level this tool has facilitated the collaboration among students involved for the first time in a software architecture design project
- At the industry level we need to test the tool in more complex environments (i.e. different countries, more than one architecture team)

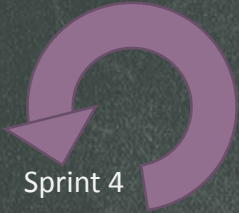




## Future work

- Real time synchronization between mobile clients and web clients
- Integration with other design tools to import and export architectural models (i.e. xmi)
- Support more viewpoint and integration with reasoning tools (ontologies) to store and search architectural knowledge





# Working with Archinotes

- Archinotes will be distributed under the **MIT** license model
- The tool will be available for **downloading fall 2014**
- For more information:  
**<http://archinotes.uniandes.edu.co>**

