

# Software Services

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# Context

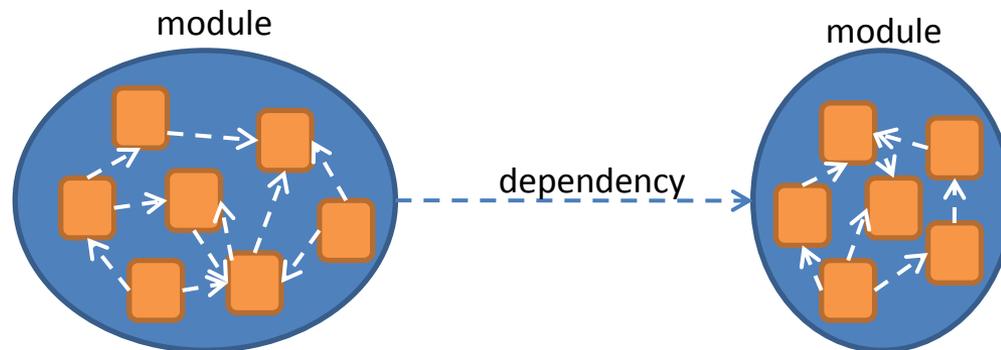
- Software Engineering
  - Methods and processes of software development
- Evolving enterprise software ecosystem
  - Hundreds of systems, systems of systems
  - Enable “business agility”: the ability to rapidly respond to the ever-changing market
- Service-Oriented Architecture
  - Break monolithic systems into software services

# Divide & Conquer

- Break the system into modules that can be
  - Independently developed
  - Easily integrated
- What's a good way to divide a big system?

# High Cohesion & Low Coupling

- Standard software design principle
  - Closely related elements form a cohesive module
  - Loosely-coupled modules enable interoperability and reuse



- How to do it in the context of an enterprise?

# Align the modules to business services

- Business services are what enterprises provide
- For example, a bank provides
  - Chequing accounts
  - Credit cards

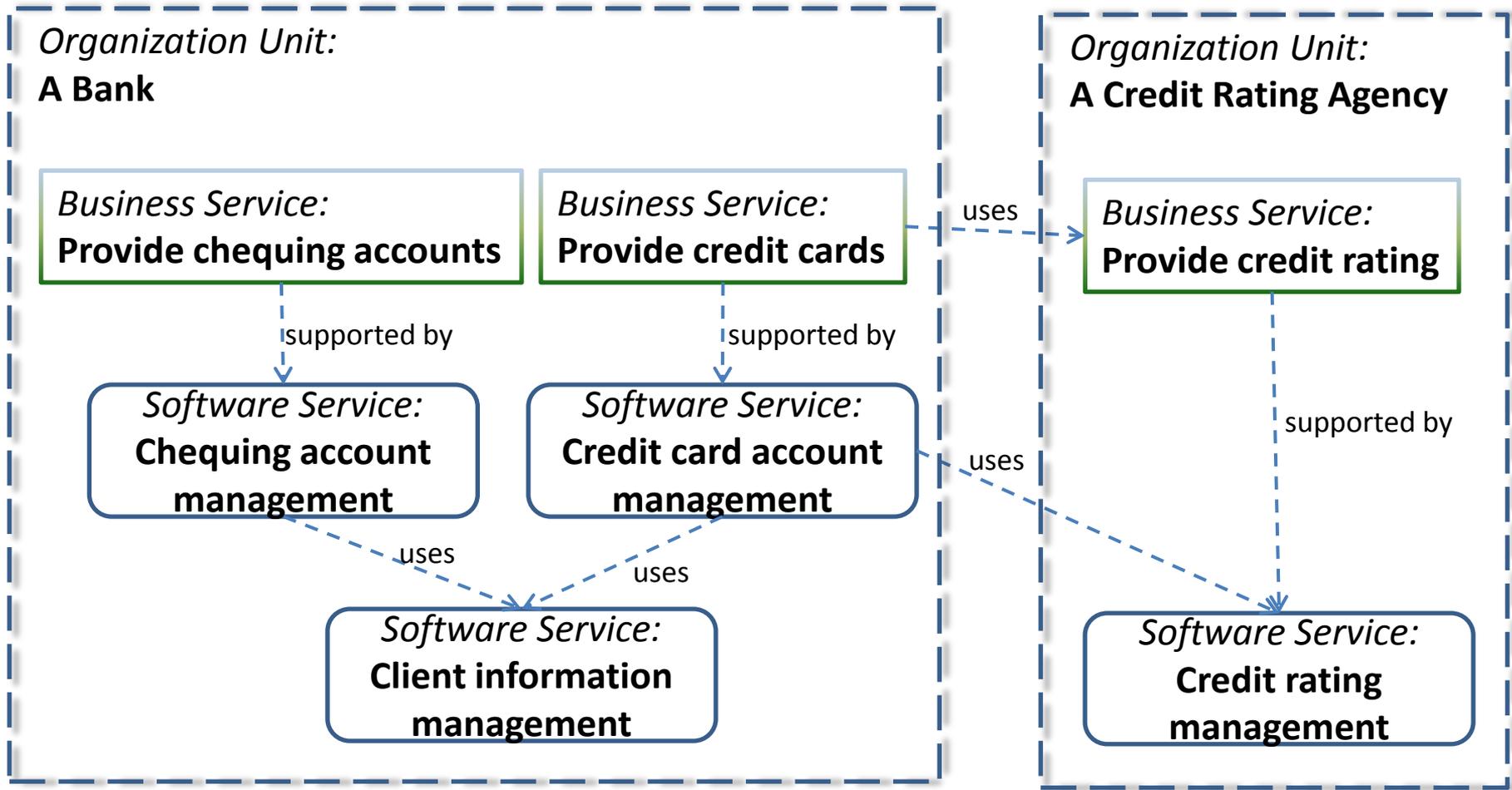
# Align the modules to business services

- Modules become *software services*
  - “A software service is a **coarse-grained**, **discoverable**, and **self-contained** software entity that interacts with applications and other services through a loosely coupled, often asynchronous, message-based communication model [BJK02].”
- Goal: “Achieve business-IT alignment” to improve business agility

# Example: a Bank

- Business services of the **bank** are supported by software services:
  - Chequing account management
  - Credit card account management
  - Client information management
- Business and software services of a **credit rating agency** that are used by the bank:
  - Provide credit rating
  - Credit rating management

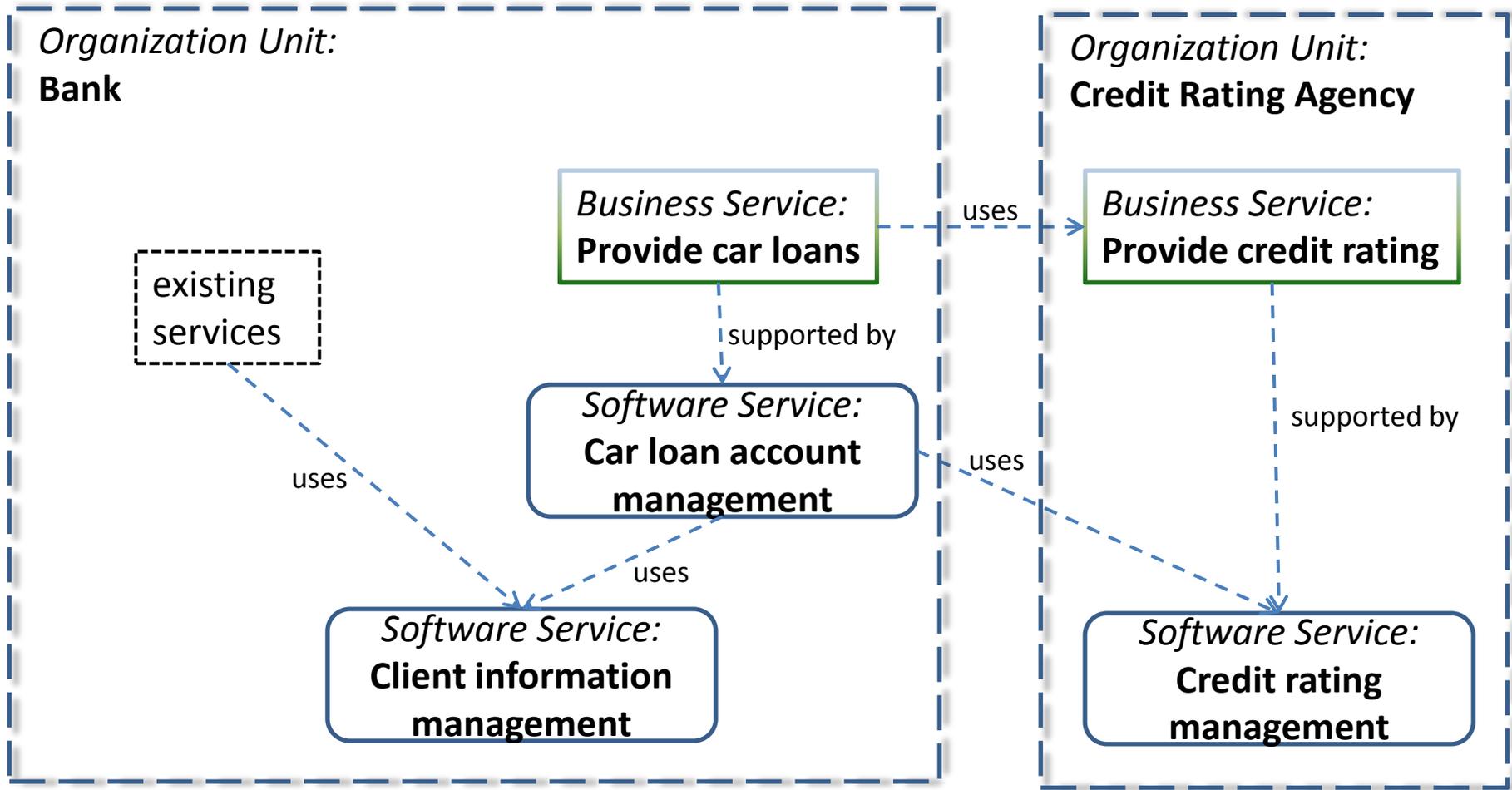
# Enterprise Architecture (i)



# Example: Need for Business Agility

- New market for car loans
- New business service needed
  - Provide car loans
- New software service needed
  - Car loan management
  - ...
- How to quickly respond to the new market?

# Enterprise Architecture (ii)



# Key concepts

- Web services
  - Software services available on the web
  - E.g., credit scoring, credit card payment processing
- Service orchestration
  - Arrangement of services into a process
  - E.g., opening a chequing account
  - Tasks automated by service invocation

# Languages and protocols

- Web Service Description Language (WSDL)
  - Defining service interface
- Business Process Modeling Notation (BPMN)
  - Business tasks both manual and automatic
- Business Process Execution Language (BPEL)
  - For execution on a workflow engine
- REST, SOAP, RSS, JSON, ...
- Prefer using models to programming

# Tool demonstrations

- Two examples of the easiest to use tools for defining and orchestrating web services
  - [Yahoo Pipes](#)
  - [Tarpipe](#)
- Not enterprise-grade
  - but a useful illustration of the concepts

# Pipe & Filter Architecture

- Data sources
  - Invokes a web service to get data
- Pipe
  - Transfers data
- Filter
  - Processes data
- Data sinks
  - Invokes a service to store results / perform actions

# Example 1: YouTube top 25 betting v1

- Using Yahoo Pipes
- A game for two players
  - The player who gives the name of the artist who has most videos in the top 25 list wins
- Data source:
  - “You Tube most viewed” web service
  - Artist name provided by each player
- Filters
  - For each player, select items containing the given name and count them
  - Select the player who’s name appeared the most

# Example 1: Place bets

## You Tube top 25 betting v.1

A simple betting game for two players. Each player gives the name of the artist who has most songs in top 25 on youtube. The player who gives the artist with the most songs, wins.

Pipe Web Address: <http://pipes.yahoo.com/mantkiew/youtubetop25bettingv1> ([edit](#))

[★](#) [Edit Source](#) [Delete](#) [Re-publish](#) [Unpublish](#) [Clone](#)

[Configure this Pipe](#)

Player 1: who has most songs in top 25?

Player 2: who has most songs in top 25?

This Pipe may require all fields to have values before it will run successfully.  
Please provide values into any empty field above and press "Run Pipe."

# Example 1: Result

## You Tube top 25 betting v.1

A simple betting game for two players. Each player gives the name of the artist who has most songs in top 25 on youtube. The player who gives the artist with the most songs, wins.

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[Configure this Pipe](#)

Player 1: who has most songs in top 25?

Player 2: who has most songs in top 25?

[Run Pipe](#)

[Use this Pipe](#)

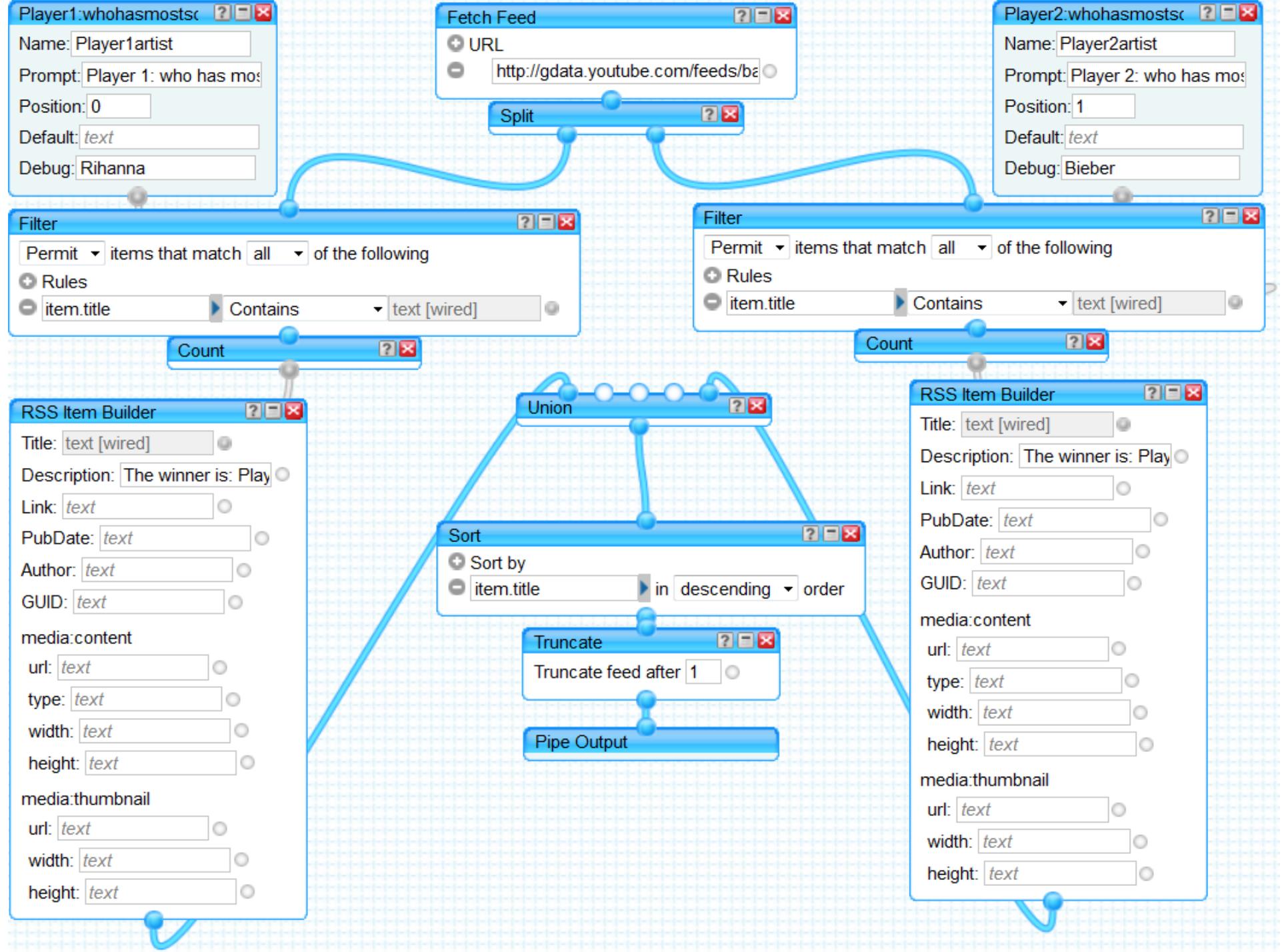
 [Get as a Badge](#)    [Get as RSS](#)  [Get as JSON](#) [More options](#)

List

1 item

4

The winner is: Player 2



## Example 2: YouTube top 25 betting v2

- Using Yahoo Pipes
- A game for three players
  - Factored out a common web service for a single player
  - Used the service three times

# Example 2: Result

## You Tube top 25 betting v.2

A simple betting game for two players. Each player gives the name of the artist who has most songs in top 25 on youtube. The player who gives the artist with the most songs, wins.

Pipe Web Address: <http://pipes.yahoo.com/mantkiew/youtubetop25bettingv2> ([edit](#))

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Configure this Pipe

Player 1: Who has the most songs in top 25?

Player 2: Who has the most songs in top 25?

Player 3: Who has the most songs in top 25?

[Run Pipe](#)

Use this Pipe

[Get as a Badge](#) [+ MY YAHOO!](#) [+ Google™](#) [Get as RSS](#) [Get as JSON](#) [More options ▶](#)

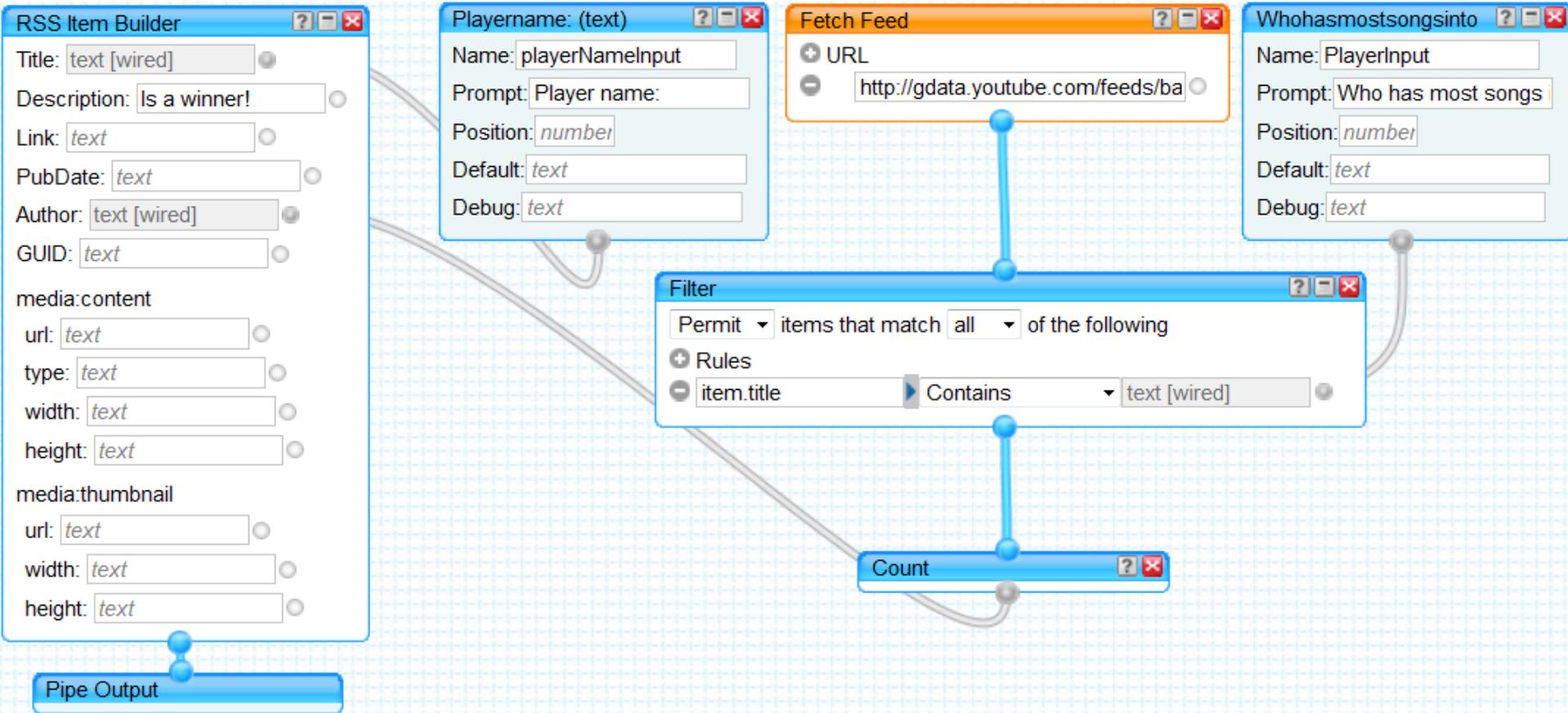
List

1 item

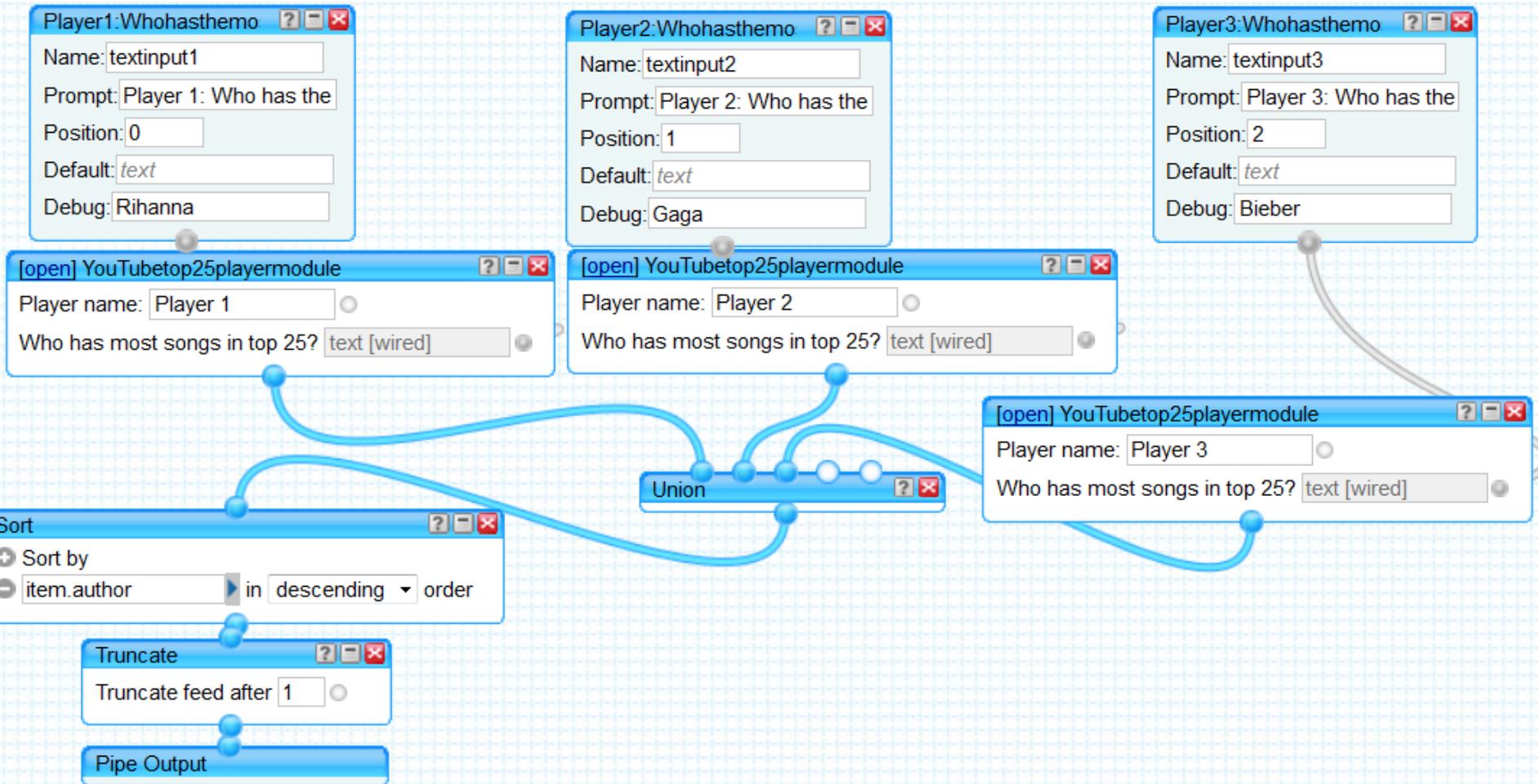
**Player 2**

Is a winner!

# Player module

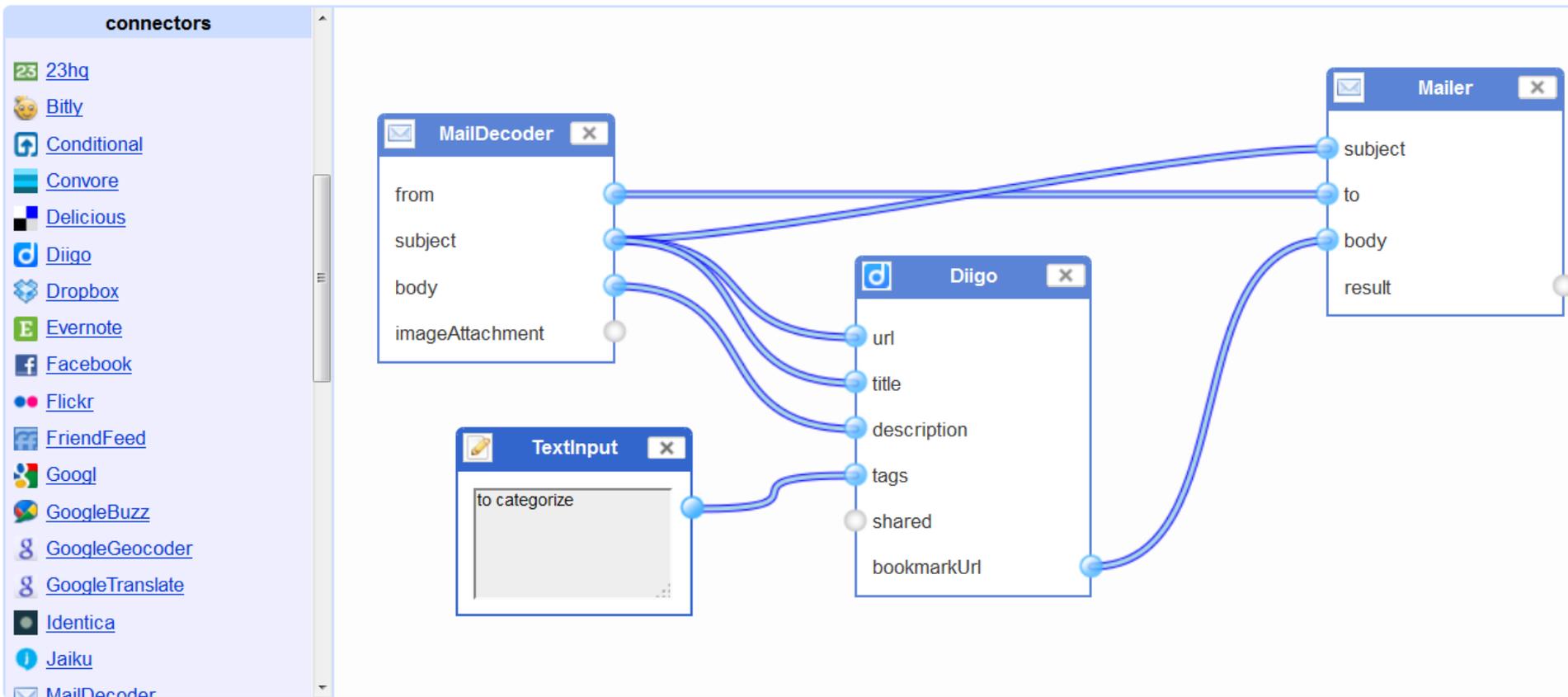


# Main



# Example 3: e-Mail → Diigo

- Using Tarpipes
- Ability to add entries to Diigo by sending email



# Example 4: TranslateAnywhere

- Using Tarpipes
- An existing 3<sup>rd</sup> party example of complex web service orchestration:
  - Photograph hand written text
  - Send to tarpipes TranslateAnywhere workflow
  - Text recognition by Evernote's web service
  - Translate by Google Translate web service
  - Receive an email with the translation

# How to find web services?

- In Yahoo Pipes, use *Feed Auto-Discovery* data source
- In general, see
  - <http://www.programmableweb.com/>



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3314

APIs

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Mashups

## New APIs

- ▶ [Voovox SMS](#)
- ▶ [Evrythng](#)
- ▶ [Placr](#)
- ▶ [Hackruter](#)
- ▶ [URL2PNG](#)
- ▶ [Shoudio](#)

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## Mashup of the Day



▶ [See previous winners](#)

## New Mashups

- ▶ [Bangkok Traffic](#)
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- ▶ [DoAt \(do@\)](#)
- ▶ [Social Butterfly](#)
- ▶ [Map for Google Places](#)

▶ [See more mashups](#)



# Thank You!

Questions?

Comments?

Ideas for nice web mashups?