

# Process Mining

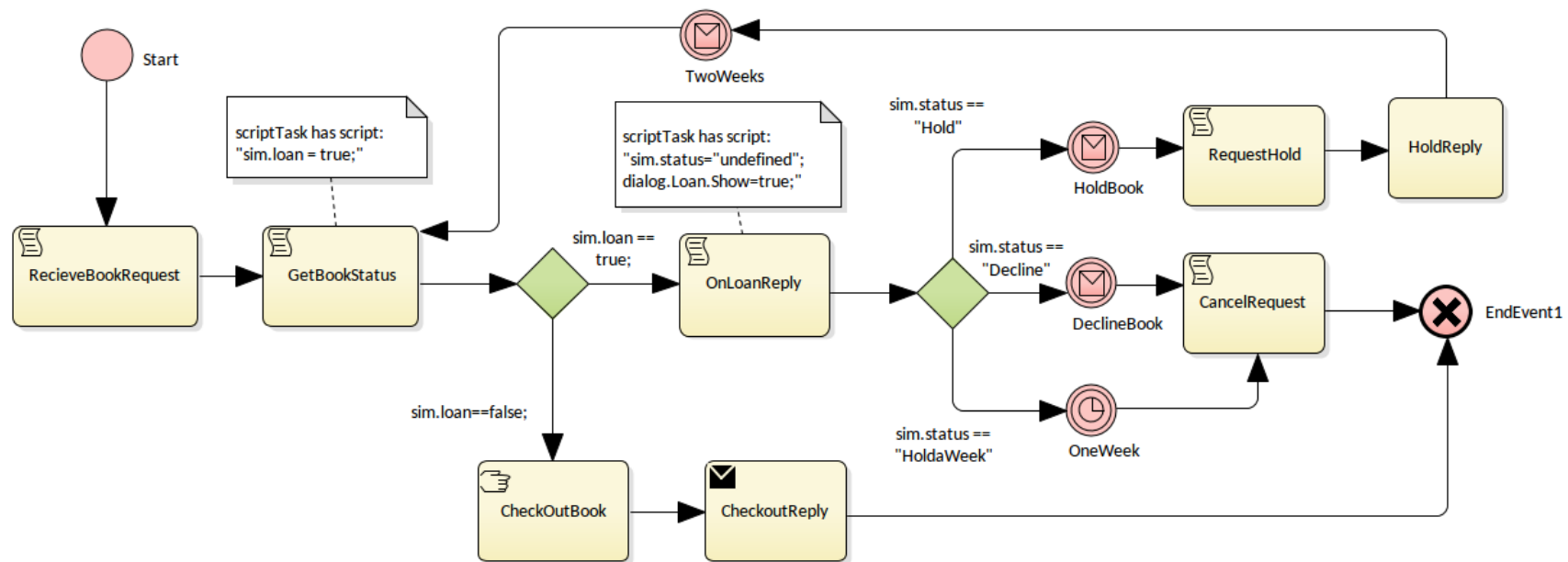
Minería de procesos

# Origen: Business Process Model and Notation (BPMN)

Business Process Book Lending Example

## Business Process Diagram

Book Lending Example



# Origen: Business Process Model and Notation (BPMN)

- Conocimiento y control de la empresa
- Punto de referencia y aprendizaje
- Compliance: detección de fallos y posibilidades de mejora
  - **Suele ser caro**
  - **Suele ser lento**
  - **Puede ser impreciso**
  - **Se desactualiza rápido**

# Alternativa: Process Mining

- Se hace automáticamente
- Se usan logs (registros de eventos)
- No se requieren de muchos datos (no big data)
- Se puede implementar casi en contínuo

# LOG:

## Ingresos hospitalarios de urgencia

handling	patient	employee	handling_id	registration_type	time
Registration	1	r1	1	start	2017-01-02 11:41:53
Registration	2	r1	2	start	2017-01-02 11:41:53
Triage and Assessment	1	r2	501	start	2017-01-02 12:40:20
Registration	1	r1	1	complete	2017-01-02 12:40:20
Registration	2	r1	2	complete	2017-01-02 15:16:38
Triage and Assessment	2	r2	502	start	2017-01-02 22:32:25
Triage and Assessment	1	r2	501	complete	2017-01-02 22:32:25
Triage and Assessment	2	r2	502	complete	2017-01-03 12:34:01
Registration	4	r1	4	start	2017-01-04 01:34:04
Registration	3	r1	3	start	2017-01-04 01:34:05
Triage and Assessment	4	r2	504	start	2017-01-04 04:25:06
Registration	4	r1	4	complete	2017-01-04 04:25:06
Registration	3	r1	3	complete	2017-01-04 06:36:54
Registration	5	r1	5	start	2017-01-04 16:07:47
Registration	6	r1	6	start	2017-01-04 16:07:47
Triage and Assessment	3	r2	503	start	2017-01-04 17:49:17
Triage and Assessment	4	r2	504	complete	2017-01-04 17:49:17
Registration	6	r1	6	complete	2017-01-04 18:12:46
Registration	5	r1	5	complete	2017-01-04 20:07:50
Registration	7	r1	7	start	2017-01-05 04:56:11
Registration	8	r1	8	start	2017-01-05 04:56:11
Registration	7	r1	7	complete	2017-01-05 06:27:49

# LOGS

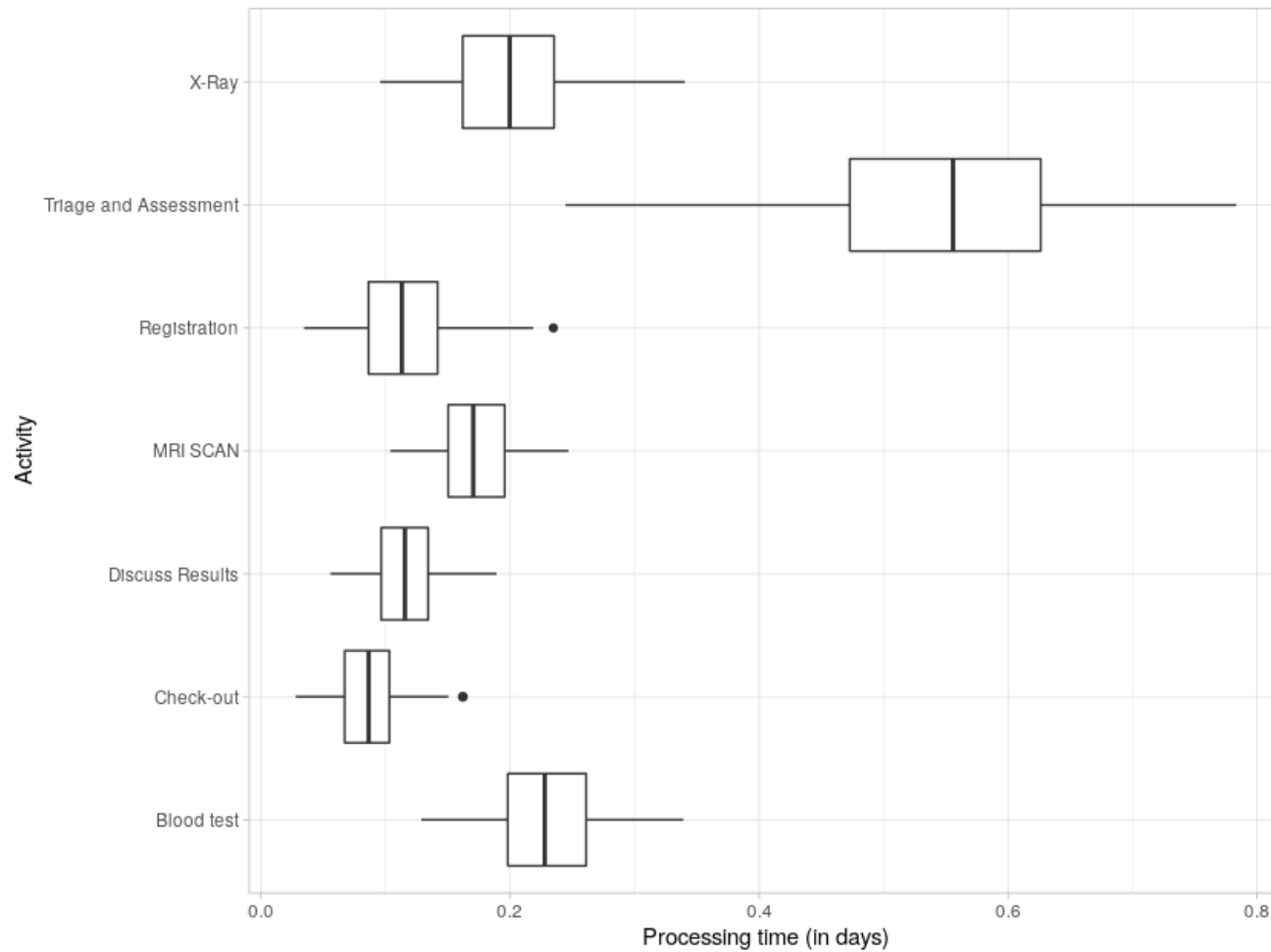
- **INSTANCIA:** Toda la secuencia de cosas que le ocurre a un paciente determinado. El sujeto del log es el *paciente*.
- **EVENTO:** Cada una de las cosas que le ocurre a un paciente.
- **TRAZA:** Todas las instancias que son iguales definen una traza. La suma de todas las trazas debe encajar en el diagrama del proceso.

# LOG:

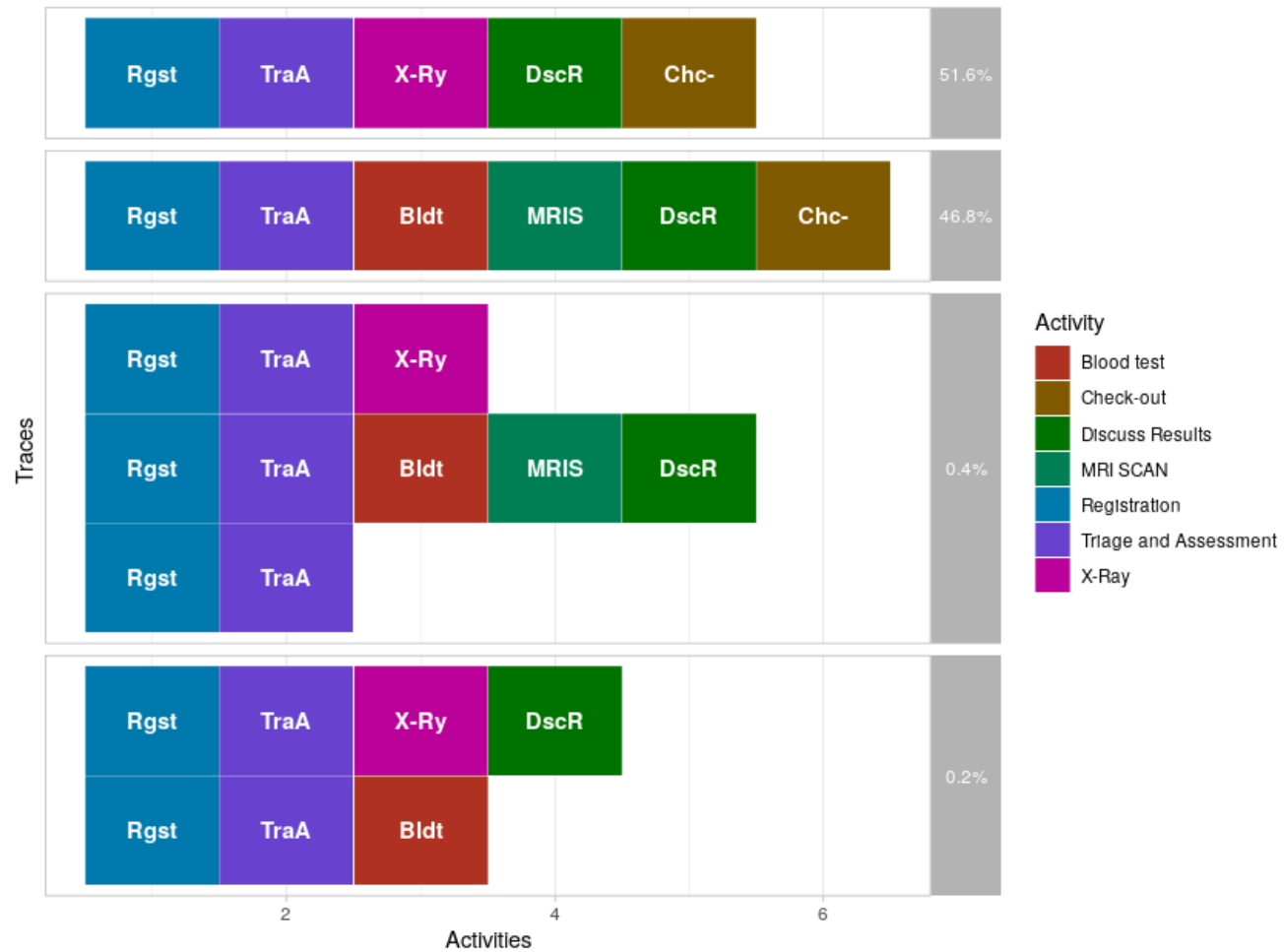
## Ordenación en función de instancia

handling	patient	employee	handling_id	registration_type	time
Registration	1	r1	1	start	2017-01-02 11:41:53
Triage and Assessment	1	r2	501	start	2017-01-02 12:40:20
Registration	1	r1	1	complete	2017-01-02 12:40:20
Triage and Assessment	1	r2	501	complete	2017-01-02 22:32:25
Blood test	1	r3	1001	start	2017-01-05 08:59:04
Blood test	1	r3	1001	complete	2017-01-05 14:34:27
MRI SCAN	1	r4	1238	start	2017-01-05 21:37:12
MRI SCAN	1	r4	1238	complete	2017-01-06 01:54:23
Discuss Results	1	r6	1735	start	2017-01-07 07:57:49
Discuss Results	1	r6	1735	complete	2017-01-07 10:18:08
Check-out	1	r7	2230	start	2017-01-09 17:09:43
Check-out	1	r7	2230	complete	2017-01-09 19:45:45
Registration	10	r1	10	start	2017-01-06 05:58:54
Registration	10	r1	10	complete	2017-01-06 09:13:28
Triage and Assessment	10	r2	510	start	2017-01-07 20:52:01
Triage and Assessment	10	r2	510	complete	2017-01-08 08:33:09
X-Ray	10	r5	1478	start	2017-01-09 15:06:48
X-Ray	10	r5	1478	complete	2017-01-09 19:29:09
Discuss Results	10	r6	1744	start	2017-01-10 07:56:21
Discuss Results	10	r6	1744	complete	2017-01-10 11:11:18
Check-out	10	r7	2239	start	2017-01-10 13:20:59
Check-out	10	r7	2239	complete	2017-01-10 15:41:59

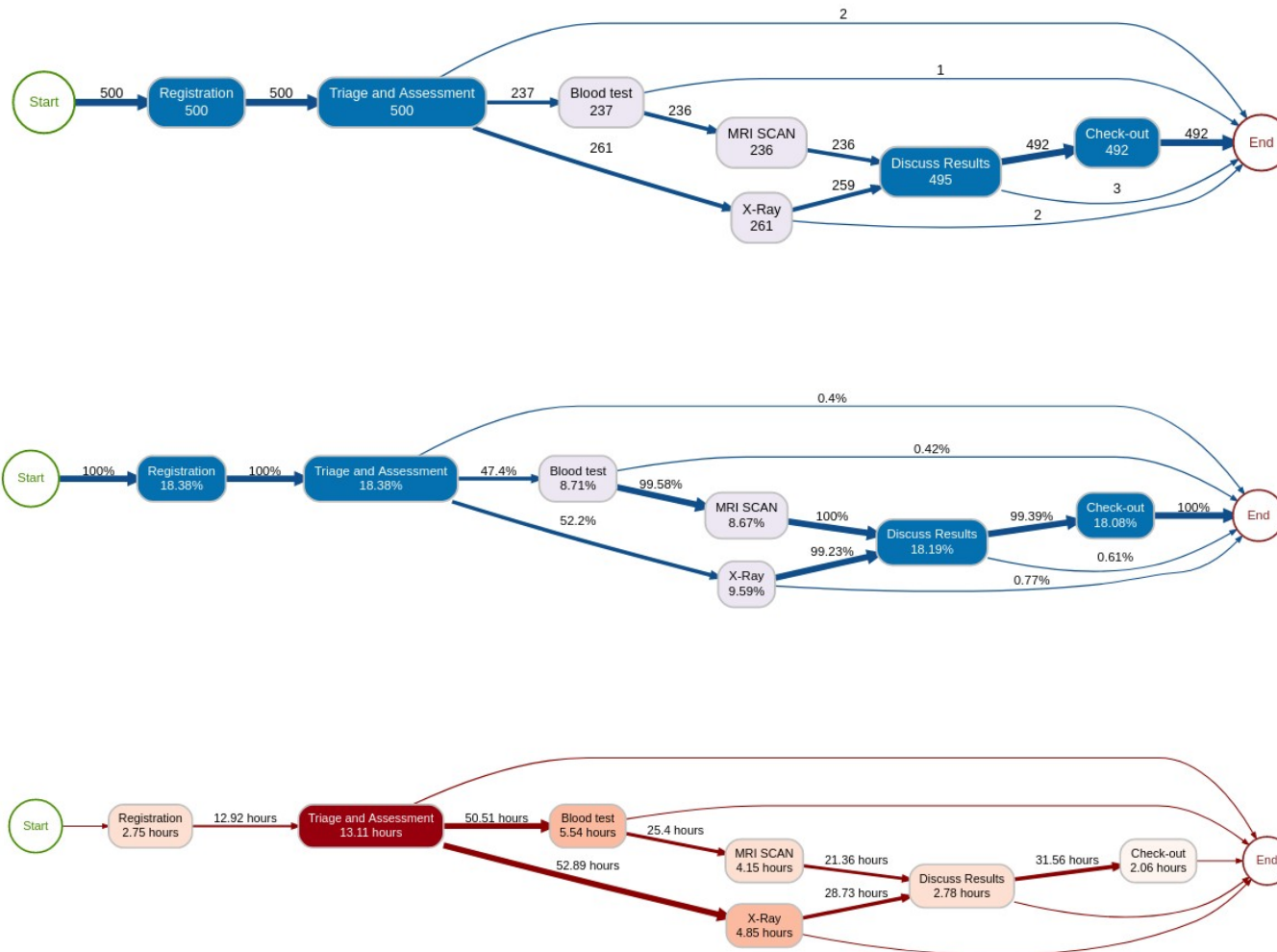
# Exploratorio



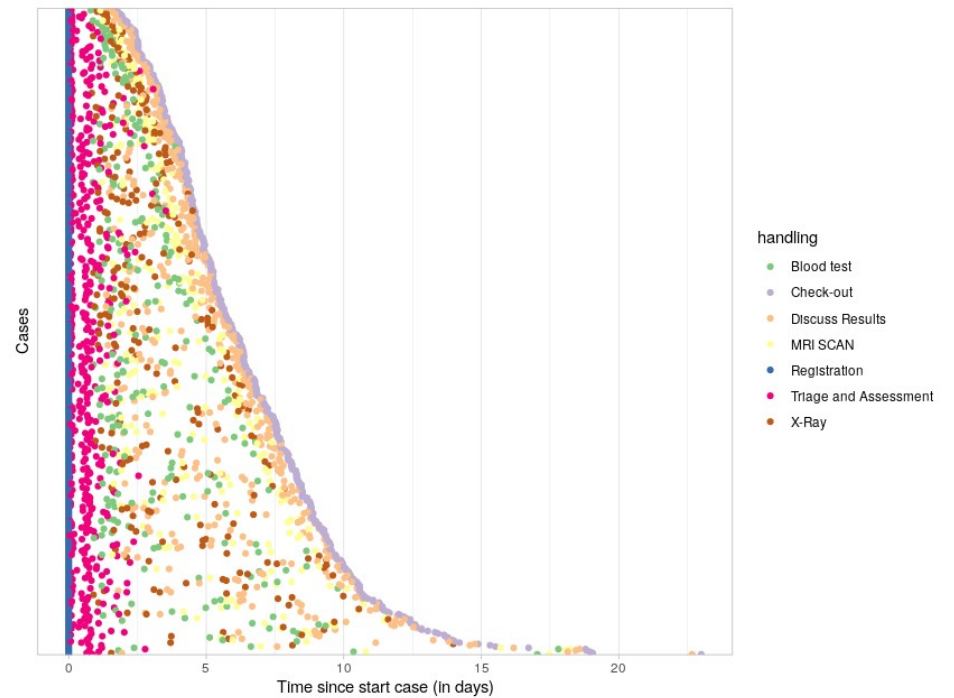
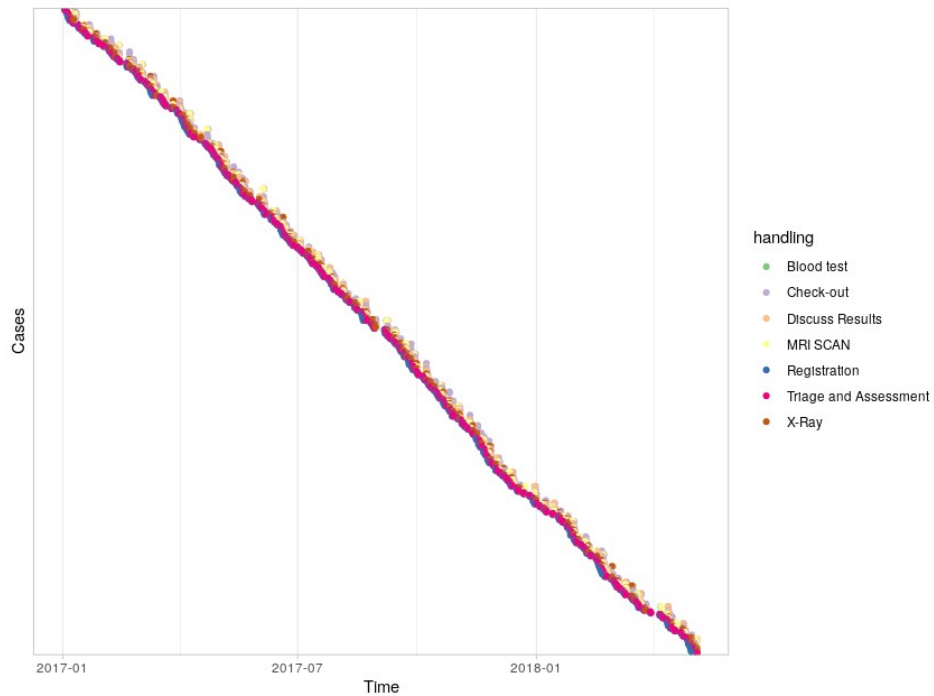




# Diagrama del proceso: Valores absolutos, frecuencias, tiempos



# Dotted Charts



# Redes sociales

