

Leveraging textual data for customer life event prediction

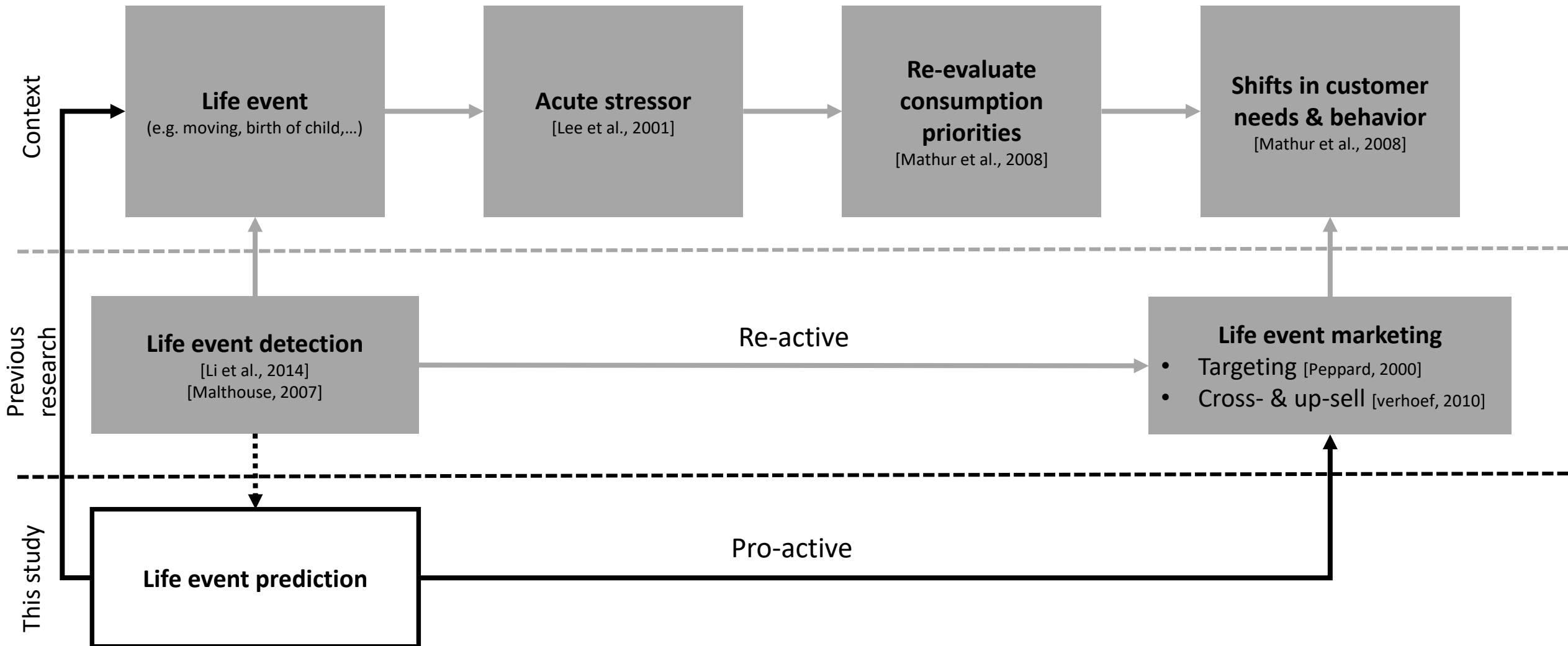


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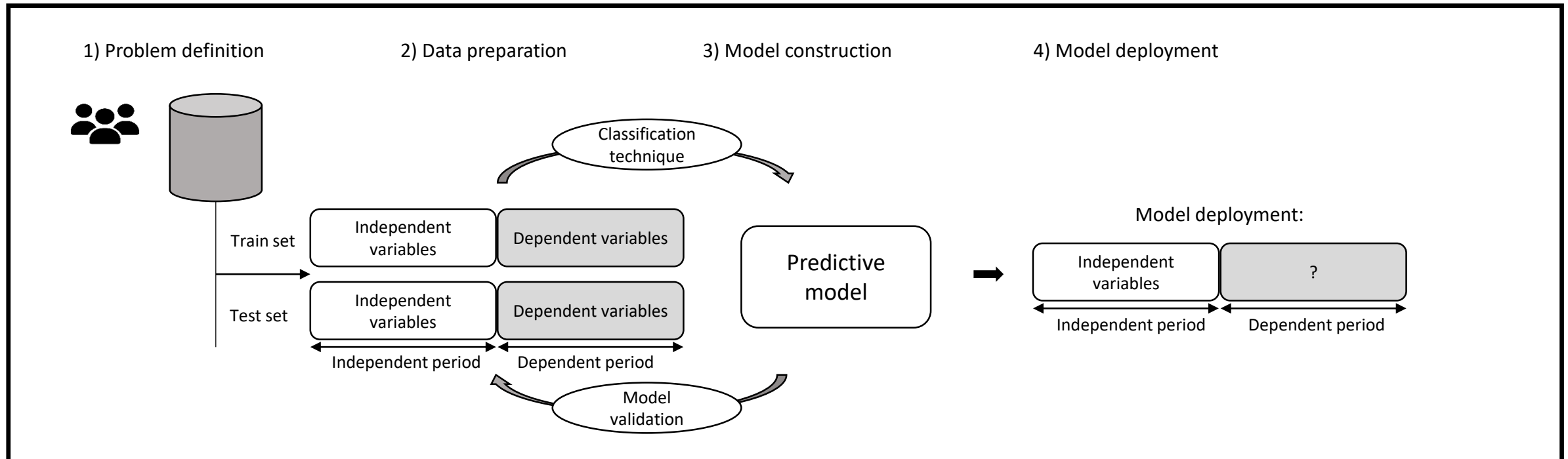
(2) *LEM UMR CNRS 9221*

1: Introduction

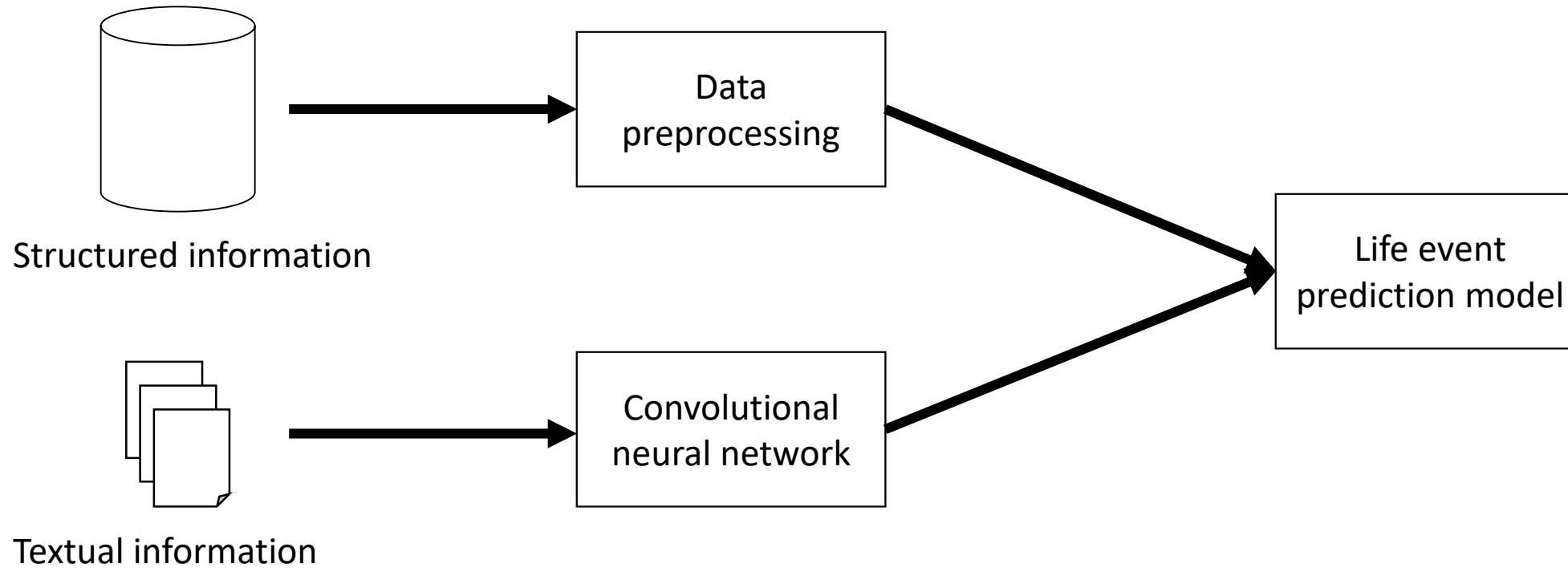


▪ Predictive modeling process

- Making predictions about the future state of a customer by using the historical data of that customer [Coussement et al., 2016]
- Typically data about customers that companies store in large transactional databases, which we refer to as *structured data* (e.g. age, time since last purchase, ...)
- Four steps of predictive modeling [Blattberg et al., 2010]

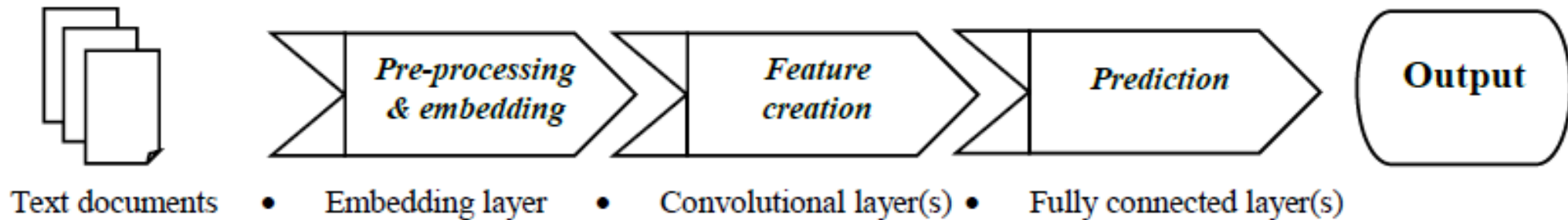


■ Modeling framework



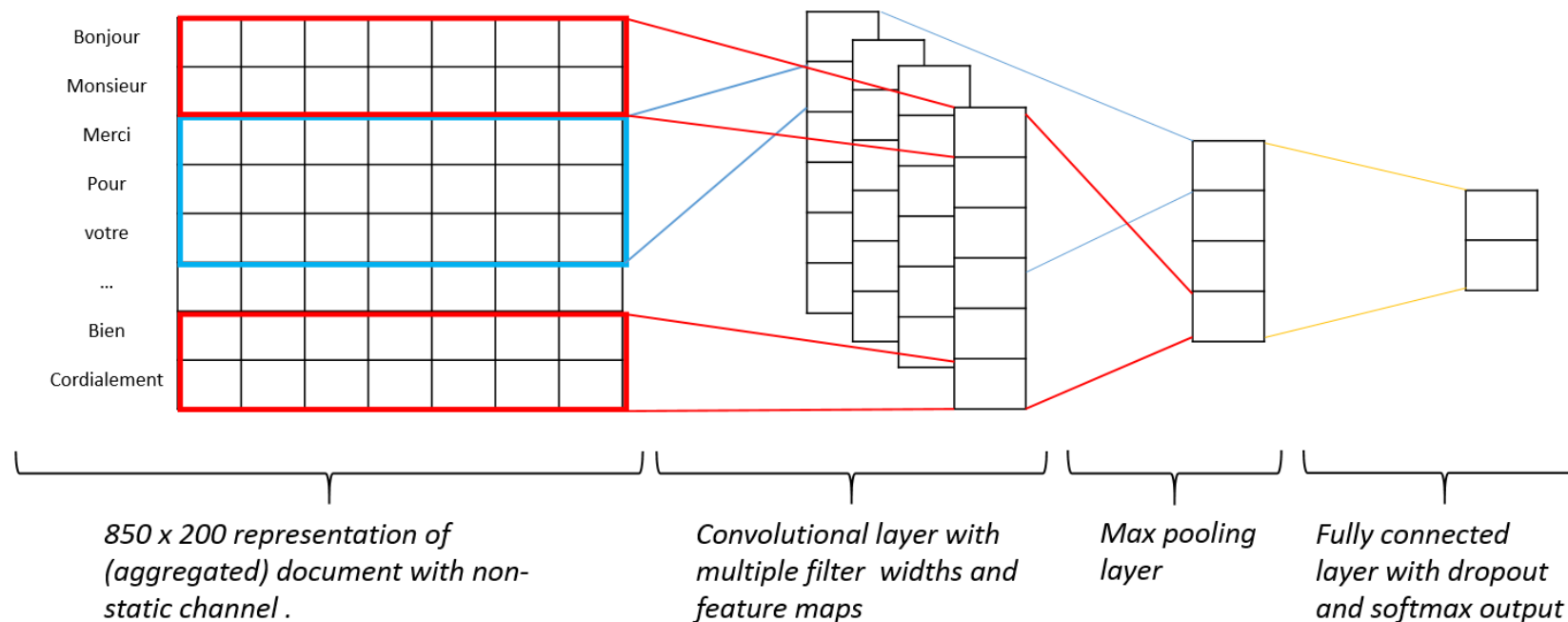
■ Convolutional neural network

- **Deep artificial neural network** that uses the **convolution operation** in at least one of their layers
- **Initially developed for image recognition** inspired by the visual perception mechanism [Henderson et al., 1980; Lecun et al., 1990]
- **Good performance in text classification tasks** [e.g. Collobert et al., 2011; Zhang, Zhao, Lecun, 2015]



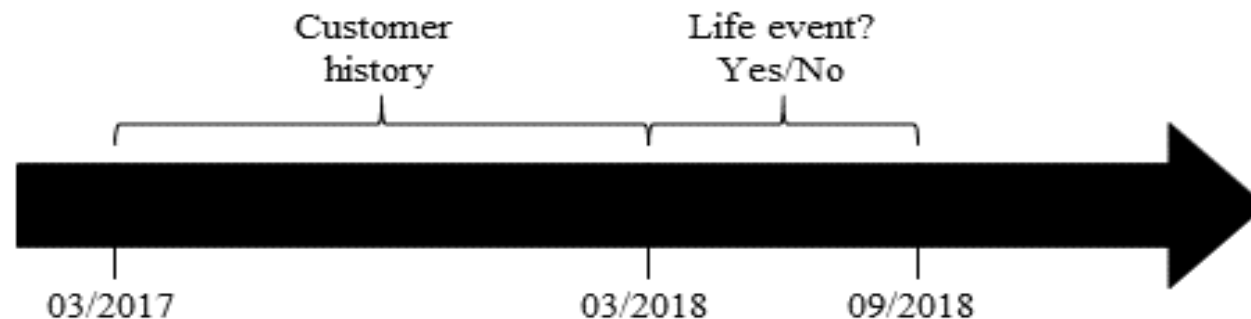
Convolutional neural network

- Emails are aggregated per client so we have one single document per client
- Shorter documents are padded with a special zero vector to length of longest (non-outlier) document
- Initial **word embeddings** are trained on entire French Wikipedia corpus using word2vec [Fauconnier, 2015; Mikolov, 2013]
- Architecture based on literature [Kim, 2014]

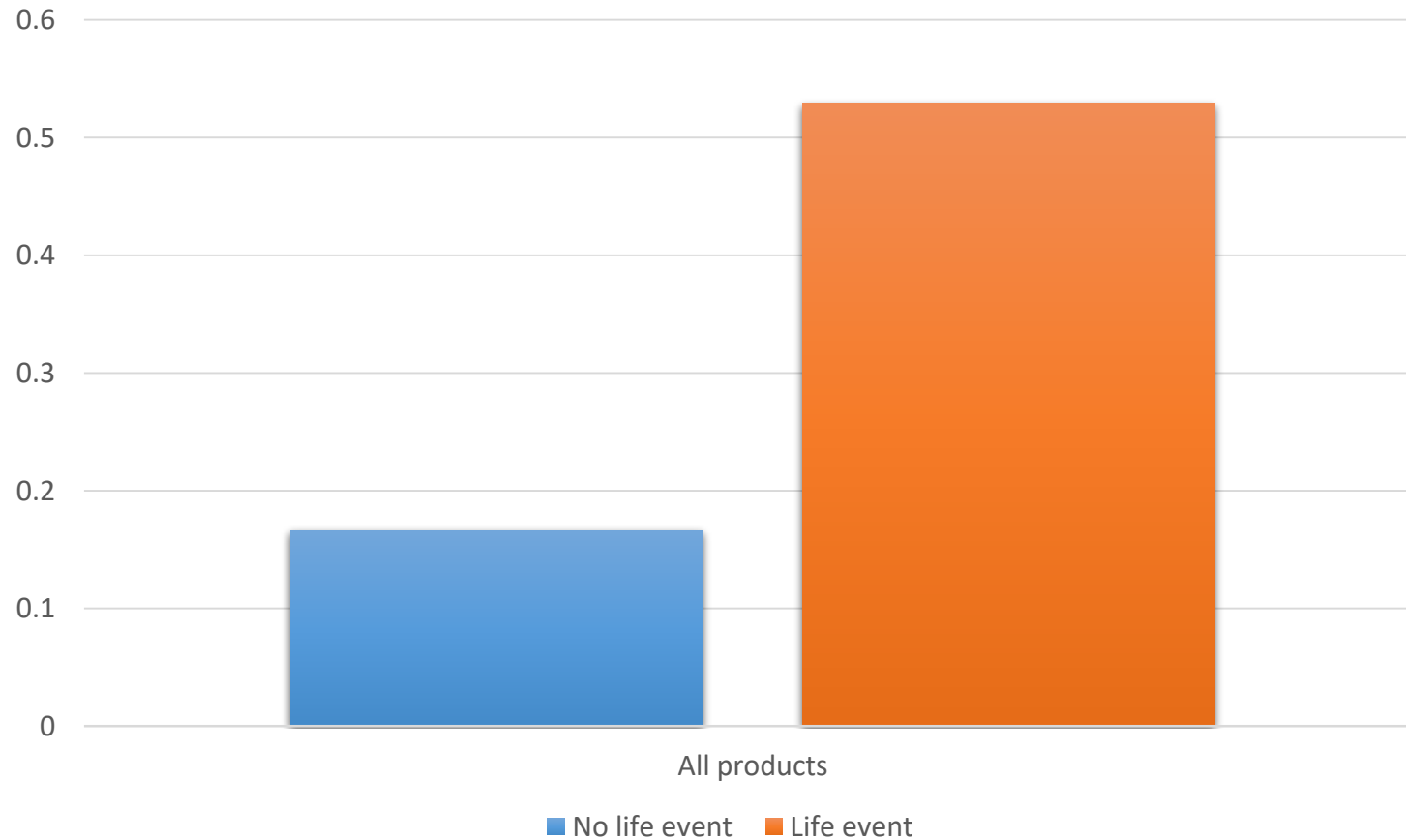


3: Experimental Setting

- **Data**
 - **Real-life** data from an European **financial services provider**
 - 21,898 customers
 - About 100,000 messages
 - 207 variables based on structured data
 - Birth of a child is considered as life event
- **Period:**

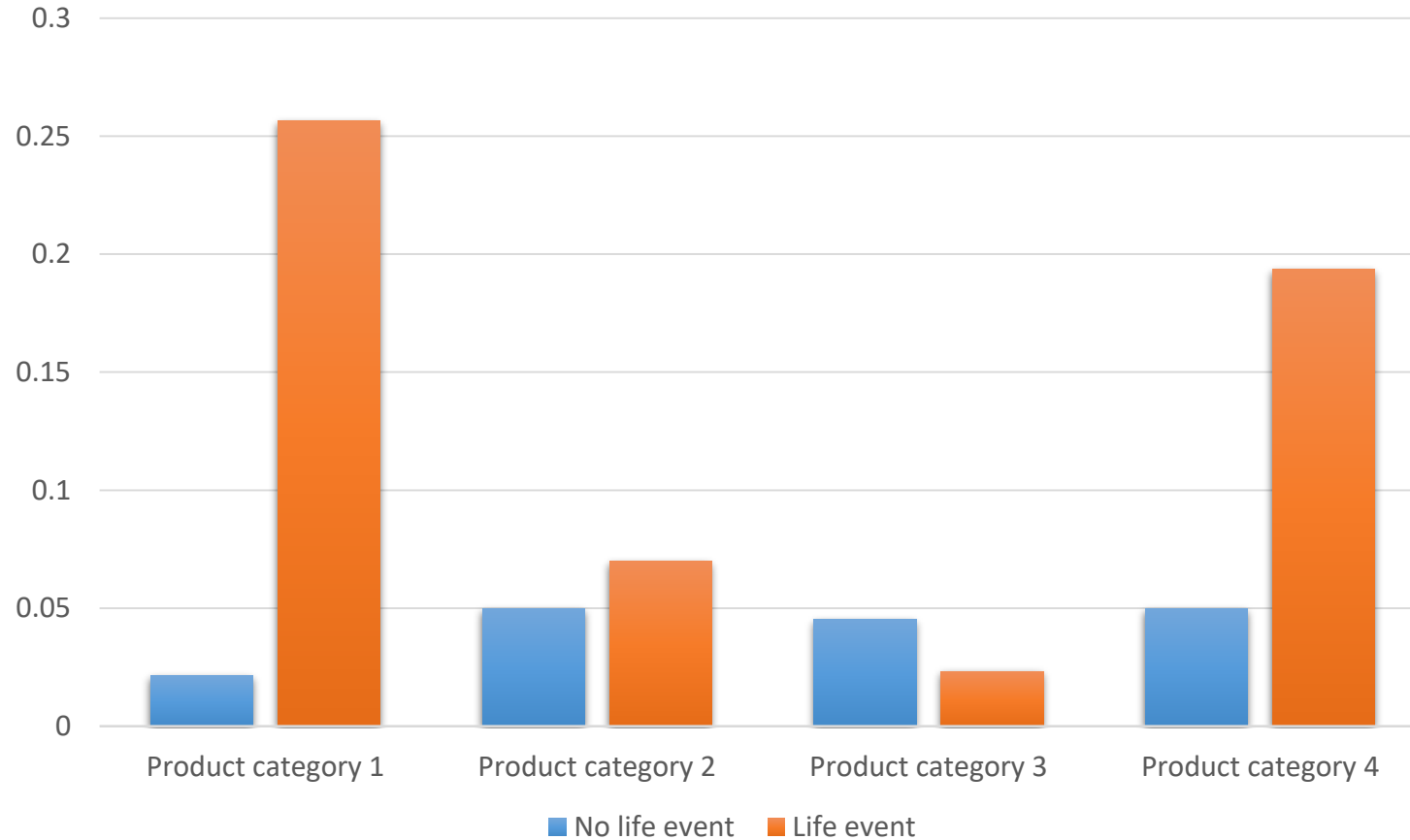


- Life event have significant effect on product possession...



Note: propensity score matching is used to determine customers without life event.

- ...But only for specific product categories



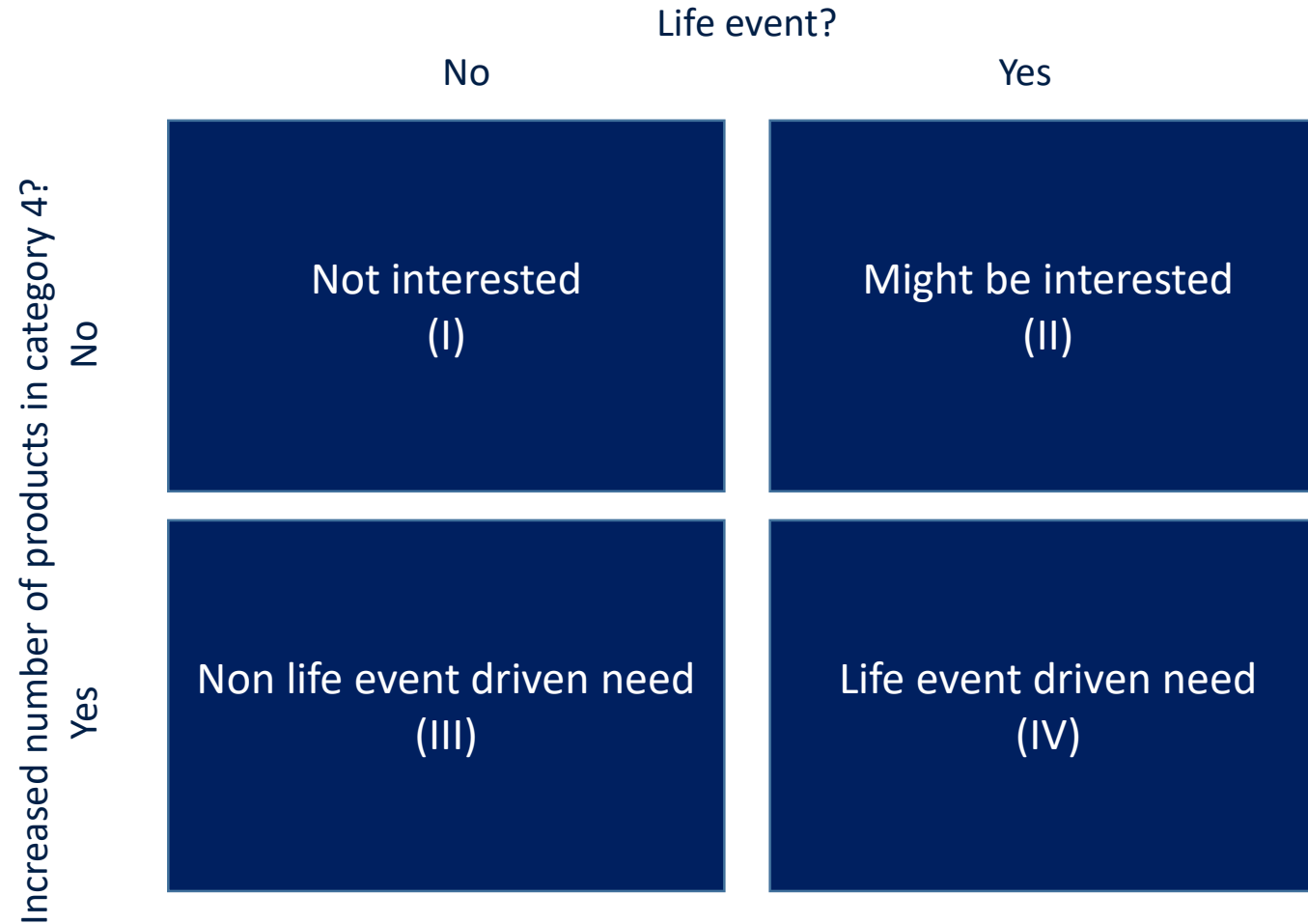
Note: propensity score matching is used to determine customers without life event.

- **Life event prediction**

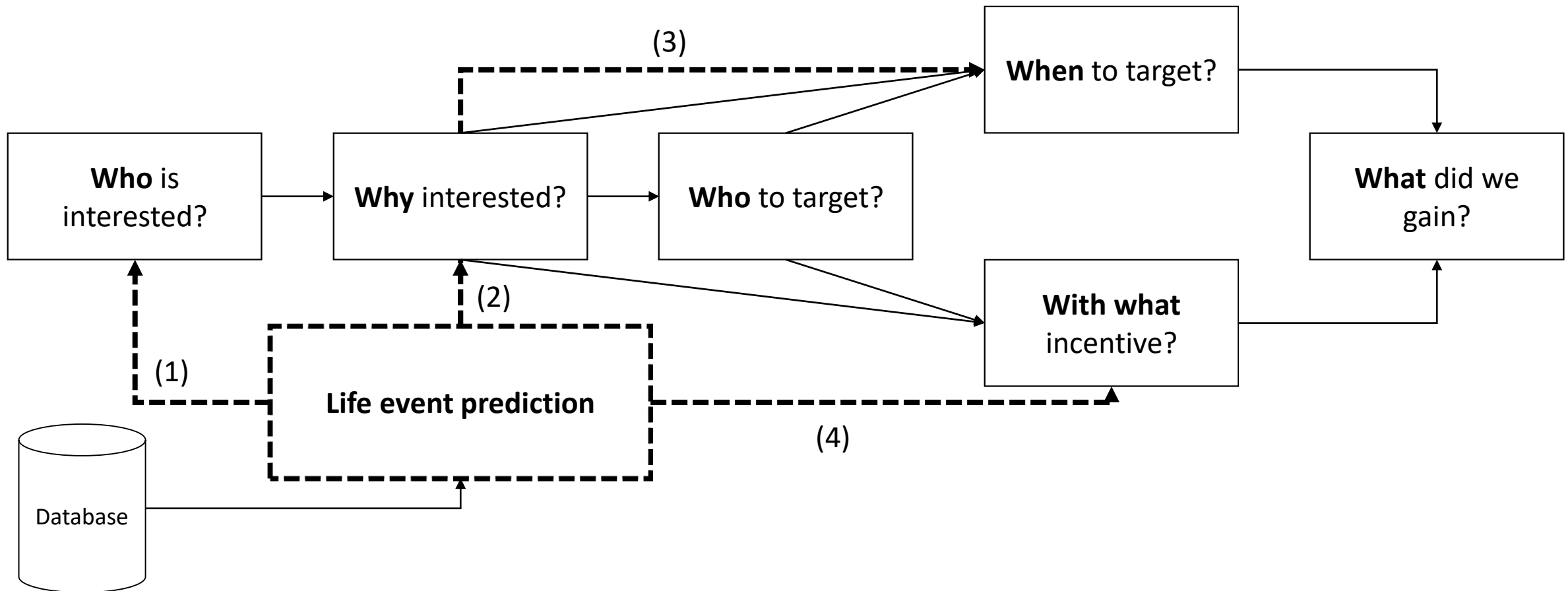
- Three models are constructed to investigate the value of different data sources
- The model that only use structured data performs better than the model that only uses textual data
- Best results in terms of AUC and TDL are obtained by the model that combines textual data and structured data.



- Life event prediction as a tool to identify purchase drivers



Framework* for cross sell using life event predictions



*Framework is based on Ascarza et al. (2018) which is developed for customer retention campaigns.

Thank you for your attention!
Questions?

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