Personalized Messaging Engine: The Next Step in Employee Engagement

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Abstract. Employers today are struggling to engage positively with their employees to reduce attrition and improve productivity. There are solutions in the market which are trying to solve the problem but they suffer from two critical issues. Firstly, the scope of the existing solutions is too narrow to capture each and every interaction happening within the company. Secondly, their learning from the employee behaviour is either non-existent or minimal at best. Personalized Messaging Engine (PME) is an attempt to provide end-to-end system to organizations for effective employee engagement. PME uses SOA principles to connect to each and every system through which employees engage with their employers. It uses the data aggregated from multiple systems to provide a hyper-personalized and dynamic experience to each employee. With the help of APIs, multiple systems can push data to PME and it then processes the data to send relevant pre-configured messages to the employees in the domain of Health, Wealth and Career. Additionally, PME uses several factors to prioritize messages for each and every employee. It uses a state-of-the-art learning engine to combine Subject Matter Experts opinion, Client Strategy, User Experiences and behaviour to find the messages which are most effective for the employees.

Keywords: Service oriented architecture · Recommendation engine · Personalized messaging · Employee engagement

1 Introduction

Employee engagement is crucial to a healthy relationship between an organization and its employees. According to [2], companies that do a better job at engaging employees do outperform their competitions. Companies today are generating data at a break neck pace at every touch point between employees and employers. There is no solution at this stage which captures all that data, analyses it and uses the analysis to improve the engagement levels between employee and employer. PME combines SOA principles and data analytics to create a solution which can fill the aforementioned gap. Given the monolithic nature of most of the applications used within a company, connecting all of them together

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is a challenging task. PME makes use of several Data-as-a-Service applications to collect data from such applications.

In order to inspire employees to read and take action on messages, it is important not only to prioritize and present highly relevant messages to employees, but also to personalize prioritization by taking into account employees feedback (e.g., ratings based on usefulness of messages, actions taken on delivered messages etc.). In addition to employees preference for message prioritization, an organization will also have its own preferences for message prioritization. Thus, it is important to combine both organizations and employees preferences for the prioritization.

We propose using Collective Matrix Factorization (CMF) [1] to jointly model preferences from employees and employer along with other related data sets such as employee demography in terms of health, wealth, career and personal information. The CMF output can be used to (i) get a joint prioritization of messages, (ii) predict buying behavior (i.e. likelihood to act upon the messages) of employees for new messages and (iii) predict relevant messages for a new employee.

2 System Architecture

PME is a combination of several services talking to each other via APIs. In addition to standard ETL processes to gather data, data-as-a-service is used to aggregate data in multiple scenarios. At the core of PME are the Messaging Engine and Learning Engine which evaluate the eligibility of a message for an employee and also prioritizes the message for her. Using REST APIs, various channels such as HR Web Portals, Mobile Applications and Call Centre communicate with PME. Additionally, PME talks to an administrative console (again, via REST APIs) which allows employers to configure their HR strategies and messages.

2.1 Overview

Figure 1 depicts the PME system. The following two are the most important components of PME: (i) Messaging Engine and (ii) Learning Engine.

Messaging Engine: The Messaging Engine allows administrators to configure employers strategy and add messages in the domain of Health, Wealth and Career. Additionally, administrators can define rules based on which PME will decide the applicability of the message for an employee.

Learning Engine: The most important module within PME is the learning engine based on CMF. The learning engine looks at multiple data points to come up with a relevance score of a message for a given employee. In addition to employee data, following are the inputs for CMF:

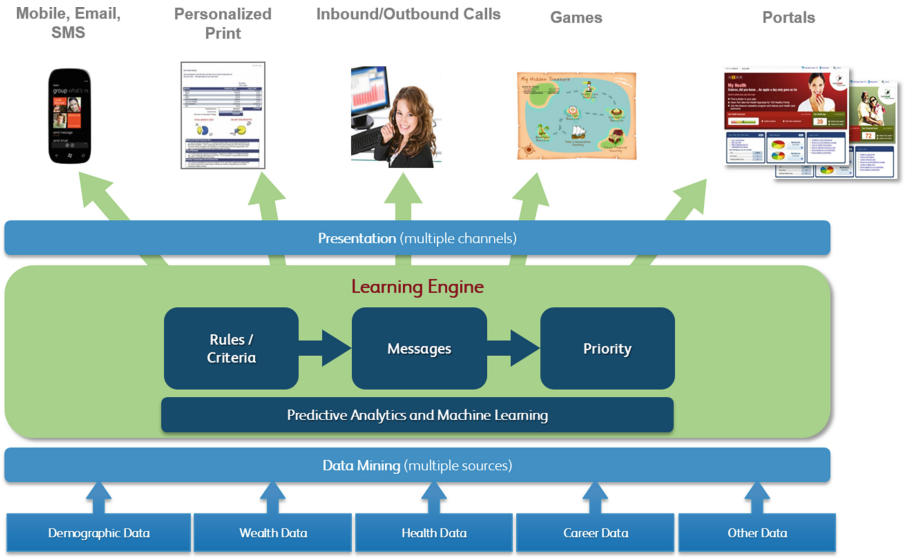

Fig. 1. Overview of PME system

1. **Risk.** A parameter defined by the Subject Matter Expert based on her view of the importance of the message.
2. **Initiative.** It captures the long term strategy of the employer and can be configured at multiple levels such as at a domain (Health, Wealth, Career) level, at a category (e.g. all preventive care messages) level and at an individual message level.
3. **Campaign.** It lets the employers control the priorities of the messages over a short duration based on annual events or seasonal events.
4. Feedback from the employees The feedback from the employees is captured at 3 different levels:
   (a) **Level 1:** Employees are asked to rate a message and the rating is captured via a REST API call.
   (b) **Level 2:** The interest of the employees is captured by storing whether they clicked on a hyperlink present in the message.
   (c) **Level 3:** If an employee acts on a message and the same is reflected through a change in her profile, it is considered as a positive feedback.

2.2 SOA Based Integration

PME has been envisioned to be channel or client agnostic from the very beginning. We have achieved that by creating a multi-tenant web service which can be completely controlled through the REST APIs that it exposes. The system uses OAuth 2.0 to manage the authentication of the users accessing the system. It provides 3 different types of access controls

1. System Administrator are super users of the system who can access all its settings and make changes when needed.
2. Client Administrator can add or modify settings specific to a client of the PME system.
3. Client Users provide authentication settings which can be used by multiple channels (SMS, Web Portals, etc.) to pull relevant messages and send it to their users.

3 Features in PME

In the demonstration, we are going to talk about the capabilities of the PME through the following system:

1. A web portal which uses the PME REST APIs to show relevant messages to its users.
2. PME Admin Console which uses the REST APIs to configure PME settings for its clients.

During the demonstration, we will cover the following aspects of PME:

1. Use the admin console to onboard a new client.
2. Add/Modify messages in the client message library.
3. Run the Messaging Engine to compute the eligibility of the employees as per the criteria defined in the messages.
4. Demonstrate the ranking of messages for each employee after the Messaging Engine has finished its computation.
5. Demonstrate the capability of PME to capture feedback at multiple levels.
6. Demonstrate the capability of learning engine by using user feedback to re-prioritize the messages for each employee.

4 Conclusion

Personalized Messaging Engine is the first major step in using a holistic view of the activities in the company to create a more productive and engaged workforce. By using SOA techniques to combine disjoint systems to create that holistic view, PME analyses vast amount of data to provide the hyper-personalized experience required to keep the workforce happy and attrition rate low.

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