A Little Reminder Can Go A Long Way

A behaviorally informed SMS experiment minimized commercial water losses in the Recife Metropolitan Region of Brazil, by increasing on-time payment rates and total amount paid

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Mind, Behavior, and Development Unit

Water scarcity remains common in Brazil, especially in the Recife Metropolitan Region (RMR) in the State of Pernambuco. The RMR is subject to particularly high levels of non-revenue water—which occur when high volumes of water produced do not generate revenue for the supplier. While some losses may be due to structural and operational inefficiencies such as leaky pipes, clients also play a key role by defaulting on their water payments or installing bypasses to consume water free of charge. This has a significant and detrimental impact for COMPESA, the Pernambuco State Water Supply and Sanitation Company.

COMPESA, as well as the World Bank's Water Global Practice and Mind, Behavior, and Development (eMBeD) teams, with financing from the United Kingdom Prosperity Fund, partnered on a behavioral diagnostic and pilot experiment to reduce non-revenue water losses through behavior change. This project provides evidence that a short-term, low-cost intervention—sending behaviorally informed SMS —has potential to increase on-time bill payment rates resulting in an increase in the utility's revenues.

The Project

A sub-set of almost 211,000 residential clients were randomly assigned to one of five treatment groups or a control group. Clients in treatment groups received an SMS reminder before their due date[1] with one of five different messages encouraging them to pay their water bill. The control group did not receive a reminder.

1. In each treatment group, clients were randomly assigned to receiving the SMS reminder either one or three days before due date. Despite these timing difference, results have shown that timing of the SMS reminder had no statistically significant effects on the outcomes.

The first treatment group received a standard bill notification message from COMPESA, while the other treatment groups received messages informed by a previous behavioral diagnostic that had uncovered insights about some of the beliefs held by clients about water supply or bill payment. The SMS reminders were sent for three months, from November 2019 to January 2020. Clients received the exact same message in each month, except for those in the seasonal group by design (Table 1).

TABLE 1: Treatment groups and messages in SMS experiment to promote water bill payment in Recife, 2019-20.

GROUP	MESSAGE	DESCRIPTION
Control	No message	No bill notification message, equivalent to a pure control.
Standard notification	"...your invoice due on xx/xx/xxxx of property xxxxx is now available for payment."	Standard bill notification message from COMPESA.
Reciprocity	"...we are working hard to bring water to your family...."	Hard work by COMPESA is highlighted to counteract client's justification of late payments as a response to receiving what they view as poor service.
Deterrence	"...avoid having your name sent to credit bureau..."	Clients are reminded of what could happen if they fail to pay, as the consequences of not paying are rarely perceived as credible by them.
Descriptive norm	"...the majority of people in Greater Recife pay COMPESA on time. Don't be part of the minority that don't pay..."	Beliefs are corrected, as most clients incorrectly believe that the majority of people do not pay their bill.
Seasonal	Nov 19: "...enjoy your 13th salary and catch up payments with COMPESA..." Dec 19: "...Merry Christmas and a Happy New Year for you and your family. Start 2020 debt free..." Jan 20: "...we loved to serve you in 2019. We are here to make 2020 even better..."	Seasonal events, such as the new year, are used to promote a change in behavior.

Note: All SMS started with "COMPESA informs: Mr(s). FIRST NAME", and all behaviorally informed SMS ended with "Please pay your bill due xx(day) /xx(month)."

The Results

Behaviorally informed SMS increased on-time payment rates. Clients that received a behaviorally informed SMS were more likely to pay their water bills on time than clients that did not receive a message. Namely, for every 1,000 clients that received the behaviorally informed SMS, the benefit of these SMS ranged from 6 to 11 additional clients paying on-time compared to those that did not receive an SMS. While COMPESA's standard notification reminder increased on-time payment rates, this effect is not statistically significant, though the other messages were. This may be because clients are used to receiving the standard message (habituation effect).

Behaviorally informed SMS increased total amount paid. Both the deterrence and reciprocity SMS had an effect on total amount paid. Taking the reciprocity SMS as an example, the intervention led to an average increase of R$1.7 per bill paid at an average cost of four centavos (R$0.04) per message. This is equivalent to a return on investment of 41. While both the seasonal and descriptive norm messages increased the total amount paid, this effect was not statistically significant.

The most effective messages were the reciprocity and deterrence SMS. Both had statistically significant and positive results on the on-time payment rate and total amount paid. For example, for every 1,000 clients that received the reciprocity and deterrence SMS, 11 and 6.5 additional clients, respectively, paid on-time compared to those that did not receive an SMS. Furthermore, when comparing effects of behaviorally informed messages against the standard COMPESA SMS, only the reciprocity message led to a statistically significant increase on on-time payment rates.

The intervention has potential to generate significant dividends at a low cost. When extrapolating the on-time payment rate findings of the best-performing reciprocity message to the larger population of clients in the RMR who default on their water bills, an estimated additional 6,400 households per month would pay their bills on time should these results persist.

Policy Implications

In a context where water availability is scarce, minimizing non-revenue water is a key policy priority. Since, historically, only slightly more than half of residential clients pay their water bills by the due date, COMPESA's ability to properly operate and maintain its infrastructure is hampered.

COMPESA's pioneer initiative to use behaviorally informed interventions in Brazil shows the promising impact of using SMS to remind and encourage clients to pay their water bills on time. It demonstrates the potential for increasing payments in a cost-effective and simple manner and by leveraging existing processes. Future analysis and experimentation are necessary, as not all SMS reminders were received or necessarily read. It will also be important to assess if the results persist over time and which type of clients were more affected by the SMS.

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The results are also important as studies indicate that clients increase their willingness to pay when companies demonstrate a genuine effort to improve product or service quality. Thus, there could be additional positive dividends, as COMPESA's role in this pilot signals a commitment to improving their internal processes.

Given the promising results obtained for the reciprocity SMS, piloting slightly different framings of this message could lead to additional positive gains over the short-term at very little cost as well as contribute to solidify the integration of this methodological approach into operations. Together, COMPESA and the World Bank plan to trial additional behavioral interventions – SMS and beyond – that can reduce non-revenue water and be sustainably integrated into COMPESA's operating model.

About eMBeD

The Mind, Behavior, and Development Unit (eMBeD), the World Bank's behavioral science team in the Poverty and Equity Global Practice, works closely with project teams, governments, and other partners to diagnose, design, and evaluate behaviorally informed interventions. By collaborating with a worldwide network of scientists and practitioners, the eMBeD team provides answers to important economic and social questions, and contributes to the global effort to eliminate poverty and enhance equity.

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