

Automated Push Notifications for Column Chromatography

Increase Efficiency, Productivity and Decrease Stress



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Overview

Automated notification software monitoring preparative chromatography skids that sends a text message to a list of user-designated phone numbers in the event of an alarm, message, and run start/end. Chromatography researchers used the notification software for > 6 weeks and then completed a survey which evaluated the effectiveness of the software.

The survey results showed automated notifications reduced the number of times a user checked on a run by 60% and reduced the “worry level” (scaled 1-10) by 48% for users performing an average of 14 runs per month with 21% of those runs issuing an alarm. In the event of an alarm, users who were immediately notified saved an estimated 2.6 hours on average.

Introduction

Pharmaceutical processes produce “muda” by under-utilizing scientists and equipment, poor time management and inefficient experiments¹. Scientists should fail fast and often² to know what does not work (even up to 50% failure rate³). However, the time spent checking on the status of an experiment and worrying about unattended experiments generates muda. This research studied the benefits of an automated notification system for preparative chromatography users and quantified the reduction of muda in a pharmaceutical R&D laboratory.

Methods

Users familiar with column chromatography purification processes utilized an automated notification software system for >6 weeks and answered the following questions:

1. How many chromatography runs do you perform per month?
2. How many of the runs from Question 1 are overnight runs?
3. How many of the runs from Question 1 are during a meeting or during lunch?
4. How many purification runs out of the number listed for Question 1 issue an alarm?
5. How has [automated notification software] helped manage your response to alarms? Additionally, has [automated notification software] saved you time in the event of an alarm? Please attempt to estimate the time saved from [automated notification software].
6. How many times do you typically check on the purification run after it has started?
7. After implementing [automated notification software], how many times did you check on the purification run after it had started?
8. Rate (1 – 10) your level of worry about a run prior to using [automated notification software] (10 = most worried).
9. Provide a second rating for your level of worry about a run after implementing [automated notification software].

Results

Chart 2. Number of times users checked on a run (blue) and level of worry (scaled 1-10; red) without and with an automated notification system.

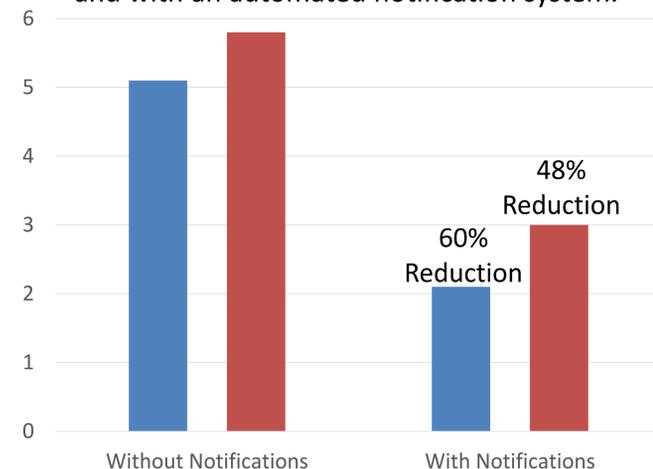
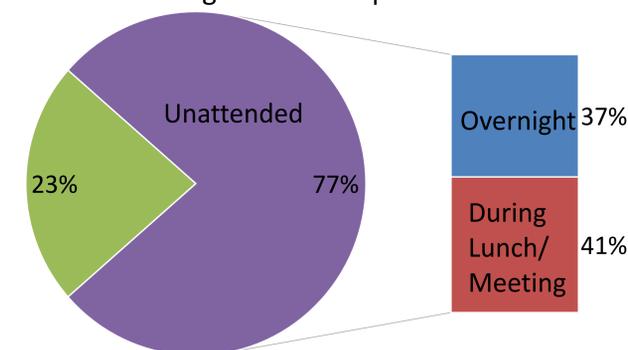
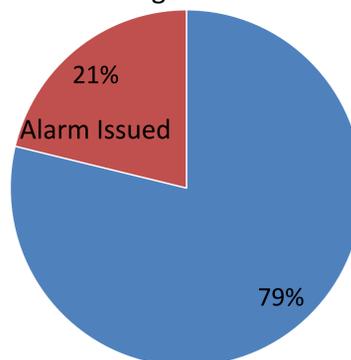


Chart 3. Percentage of runs that were unattended (i.e. overnight or during a meeting/lunch). Users executed an average of 14 runs per month.



Results

Chart 1. Percentage of runs that issued an alarm. An alarm pauses the system until acknowledged by the user. The automated notification software reduced the time between alarm issuance and alarm acknowledgement by an average of **2.6 hours**.



Conclusions

The automated notification system reduced the time associated with checking on a run and reduced the response time to an alarm, thus increasing user efficiency. Users worried less about their chromatography runs knowing a notification system was monitoring the equipment.

Many processes requiring attention and time similar to preparative chromatography (e.g. bioreactors, HPLC, cell-based assays, etc.) could benefit from automated notification systems. Automated notification systems could also increase transparency and response time between contracted manufacturing organizations and their clients. It is also a tool of quality systems management.

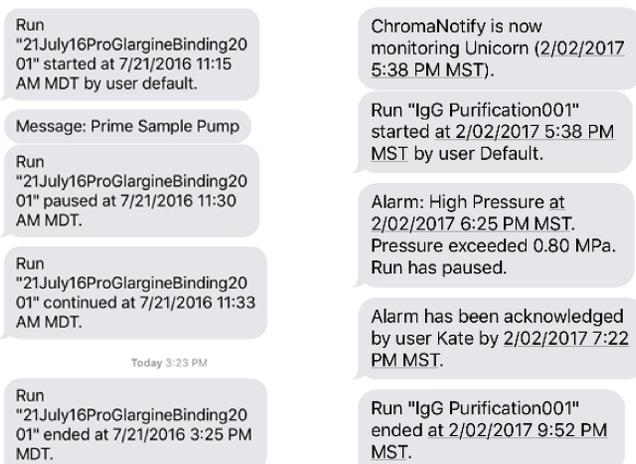


Figure 1. Examples of notifications.

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References

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