S7ProdTrac

User Manual

Table of Contents

INTRODUCTION

Concept: As a result of a planned enhancement of monitoring the of food imports to the United States, the FSCPA, which is the entity is responsible for certifying imports to the US, has published quality audit guidelines for companies that intend to export food to the US. It should be noted that the US is one of the largest global markets, and that many other countries implement quality controls that are compatible with US standards.

More information regarding the guidelines are present in available safety plan worksheet and examples, labeled appendix B and A respectively. If guidelines are routinely followed, it is highly likely that

    a.   any end product generated will be free of faults.

    b.   If there is a suspicion that any and product may have a defect, a full traceability report should be presented to the FSCPA within a time limit specified by the auditing unit. As at the time of this writing, the time limit is 4 hours.

SYSTEM OVERVIEW

The S7Prod.trac application consists of two components. The first is a cloud enabled repository that records templates of the production processes that are applied to products and related historical data. The second component is a mobile app that is to be deployed close to production points to capture actual data events relation to the production of each batch of the product. A need for the application arose based on the unsuitability of general purpose computer systems in many production areas. As such, records of the events that occur on each step of each batch is captured on a rugged tablet, so the information can be available for detailed batch historical reports.

This document is aimed at allowing a users to quickly become effective in using the application. It then covers the basics of creating a product, allocating control points or step on the product, assigning hazards to a step, assigning preventative measures to a hazard, and then printing a product traceability report. We then spend some time ensuring users understand the process of adding, editing and removing steps. One nuance in managing steps is the existence of a self-audit warning feature that test to see if any step exists that does not have an associated hazard. There also exists a self audit error test that ensures a user has identified at least one preventative measure for any hazard defined on a product.

Note that once a step is modified, the system interprets the new representation of the product as a new version. The manual then explains how to save versions, and revert to earlier versions. Subsequently, the manual explains how to use the mobile app to track the creation of product batches, and record detailed activity as a batch progresses through manufacturing steps. It then closes with an explanation of how to generate a detailed production report for each batch of a product.

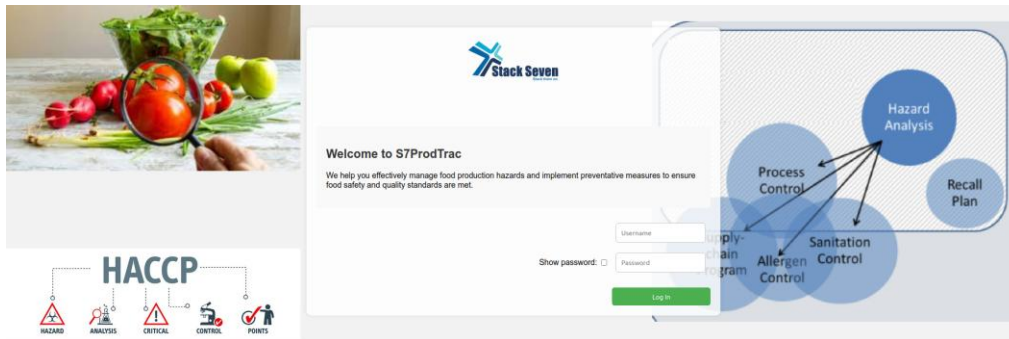# CHAPTER 1. CONNECTING TO, AND CONFIGURING PRODUCT DATA

Figure 1. Logging in

PRODUCT, HAZARD AND MEASURE LISTINGS

The main data elements managed by the system are Products, Steps, Hazards and Measures. For the purpose of this document, a Product refers to a class of item created by the producing company. A Step is a stage in the creation process. A Hazard is a negative risk that may be encountered in the execution of a step. A (preventative) Measure is an action that is expected to be performed to mitigate the probability and/or impact of the hazard.

After logging in, the initial screen presented to the user (See Figure 1) contains a set of tabs that allows the user to look at previously created Products, Hazards and Measures. Each list can be filtered by typing into the box below the Add Product link. Authorized users are able to add a product by clicking the Add Product link, and to remove products (for which batches have not yet been created), by clicking the check box beside the products(s) to be deleted, and then clicking the "Remove Product" link.
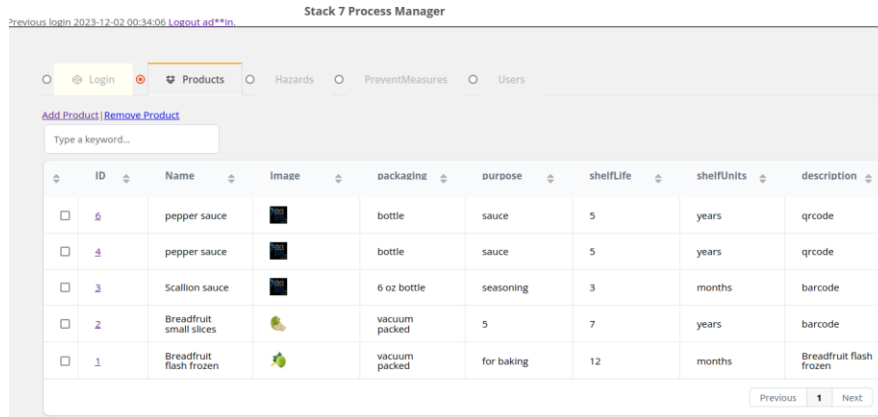
Figure 2. Main listing screen with product listing enabled.

The product listing shows the name of the product, an image, as well as information on it's packaging, purpose, shelf life, units for the shelf life, and a description. If the number of products in the system is greater than that which can be displayed on the screen, the products are displayed in pages. Similarly, clicking on the hazard listing will show (filterable) the list of hazards previously recorded in the system, and clicking on PreventMeasures will show the list of measures previously recorded. In order to see the details of a product, from the product listing screen, click the link that shows the product number in the list.

MANAGING A PRODUCT

The product detail screen(see Figure 3) contains three main sections. Immediately below the product number, product data, including a picture is displayed. Below the product data, an option print a hazard report for each step(to be described later) is then presented, and an option to return to the product list is given, as well as a link to edit the product. A list of batches is then presented, and a report on the data collected during the batch can be accessed by clicking the link to the rightmost column of the batch list. To the right of the screen, a list of steps required to create the product is displayed. Details of managing steps are described later.
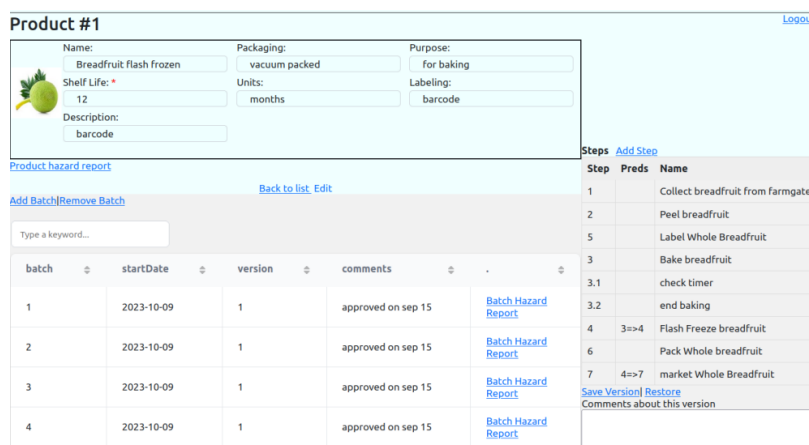

Figure 3. After clicking a product id, the product detail screen appears

When the edit link is clicked, the text data on the screen becomes editable (See figure 4) and the "Edit" link changes to an "Update" link. A button labeled "change" also appears below the image, which allows a user to click it and change the picture. After clicking the change button, a screen that allows the user to click on images (see figure 5) appears, and the user is expected to choose the most appropriate one.

Figure 4. Editing a product.

Once the "Update" link is clicked, changes will be saved to the database.

Figure 5. Setting a product image

MANAGING STEPS

Figure 6: Crop of Figure 2 focusing on steps.

The step listing (See figure 6) allows management of the steps to create a product. Each step has an internal id which is not displayed, and the "Step" column shows sequence of steps that were assigned when the product was initially created. A user can drag a step up or down in the list to model the actual sequence used, and the initial sequence is useful in maintaining context. Note that each time the list of steps is modified, it is considered a new **version** of the product.

Subtasks can also be represented, as shown by steps 3.1 and 3.2, that help to make up step 3. The system also models dependencies between steps, as figure 2b indicates that it is important to complete "Bake Breadfruit" before "Flash Freeze Breadfruit", and that "Flash Freeze Breadfruit" should be done before "market Whole breadfruit".

In order to add a step, click the "Add step" link, and a screen similar to figure 5 appears. The Step Name should be typed in. If nothing had been selected in the list of steps prior to clicking "Add Step", the Part_of dropdown will show the data "No parent task", otherwise the contents of "Part_of" will match the selection in the step list. The "predecessor" dropdown will show the information "No predecessor". In order to make the new task a subtask, select the intended parent task in the task list, then click "Add Step". In order to change the parent task, predecessor, simply select the new parent task or predecessor. In Figure 7 below, "Pack Whole breadfruit" was selected as a predecessor. When comfortable with all changes, click "Save". If you do not wish to go through with the Save, click Cancel.

Figure 7. Adding a step

Note in figure 8, that after saving the changes, task "Deliver to store" with sequence number 8 appears in the step list, that depends on "Market Whole Breadfruit"

Figure 8. The updated step list after adding new step

In order to edit a step, click the step of interest and then click on "Edit Step". A screen similar to the one presented in Figure 7 appears, with default data populated from the step on interest. The process to delete a step is similar. There is however a nuance, as steps that have sub steps, or steps that are predecessors of other steps, should not be deleted. S7ProdTrac assists in checking these conditions, and presents an alert if either is detected(See figure 9). The message was presented after selecting step 3 then clicking "Remove Step". Note step 3 has sub steps 3.1 and 3.2. Note step 3 is also a predecessor of step 4. When a step is successfully removed from the screen, it's association to the product is removed, but a record of it remains in the event it was is a part of existing batches.

Figure 9. Attempting to delete a task that is a predecessor, and has subtasks

Managing Hazards

Each hazard in the system is associated with a step. One way to see the hazards in the system is to use the main screen shown in Figure 1. Another way is to select the associated step from the product listing, the clicking "Edit Step". If hazards are associated with the step, the list of hazards will be displayed. (See Figure 10).
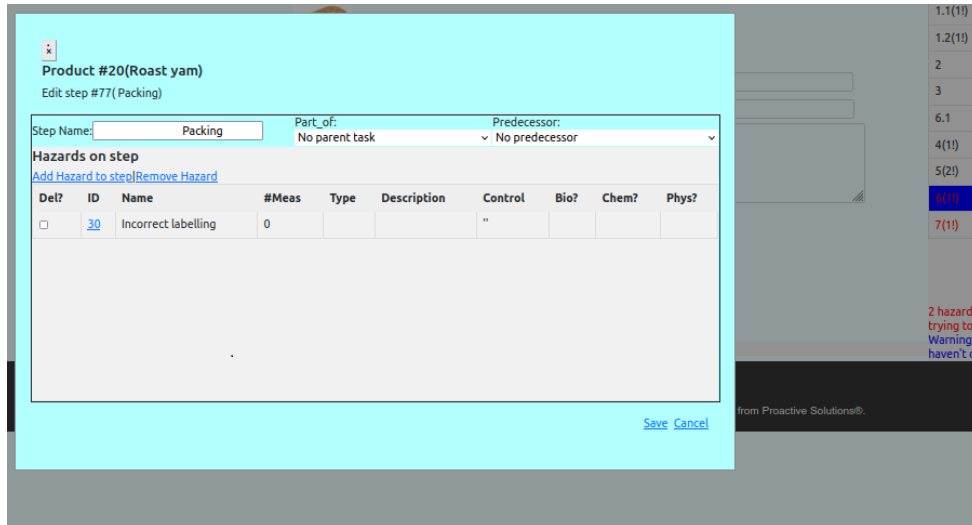
Figure 10. The Hazard List for a step on a product

The step detail screen also allows hazards to be added or removed. In order to view details of the hazard, click the hyperlink with the hazard Id, after which the hazard detail screen, shown in Figure 11, will appear.

Figure 11. Detail of a hazard, with the associated preventative measures.

Using the hazard detail screen, the details stored on each hazard can be managed. Preventative measures on each hazard are also displayed, and additional measures can be added. Note that, each hazard in this system will be presented in the mobile app, and the user is expected to indicate that all applicable measures have been addressed.
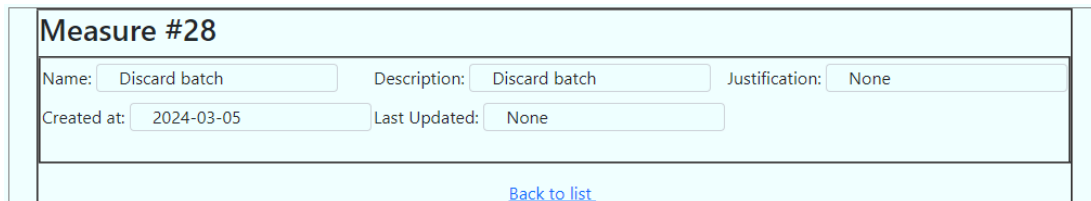

Figure 12. Detail of a Preventative measure

Preventative measures are associated with hazards by clicking "Add Measure" from the hazard detail screen. Once associated, the measure will appear in the list of measures linked to the hazard. Clicking on the measure id brings up details of the measure, shown in Figure 12.

Warnings and error checks to keep products consistent.

As products and the related steps are created and updaed, S7ProdTrac tracks the association of hazards and measures using the following guidelines to avoid data anomalies…

a. If there exists a step without an associated hazard, it could be possible that the hazard was overlooked, and so the system should warn the user.
b. If there exists a hazard without any preventative measure, the system should log an error that prevents batches form being created on the current version of the product.

Figure 13. Measures and warnings after saving steps

Figure 13 demonstrates how the system alerts users to anomalies in the data.

Managing versions

Note that once a step is modified, a user is allowed to save a new version of a product, as described in section 2 on Steps. If there is a need to revert to a previously saved version, the "Change version" link pops up a window that allows the user to enter the version number of the prior version between 1 and the number of the last saved version.
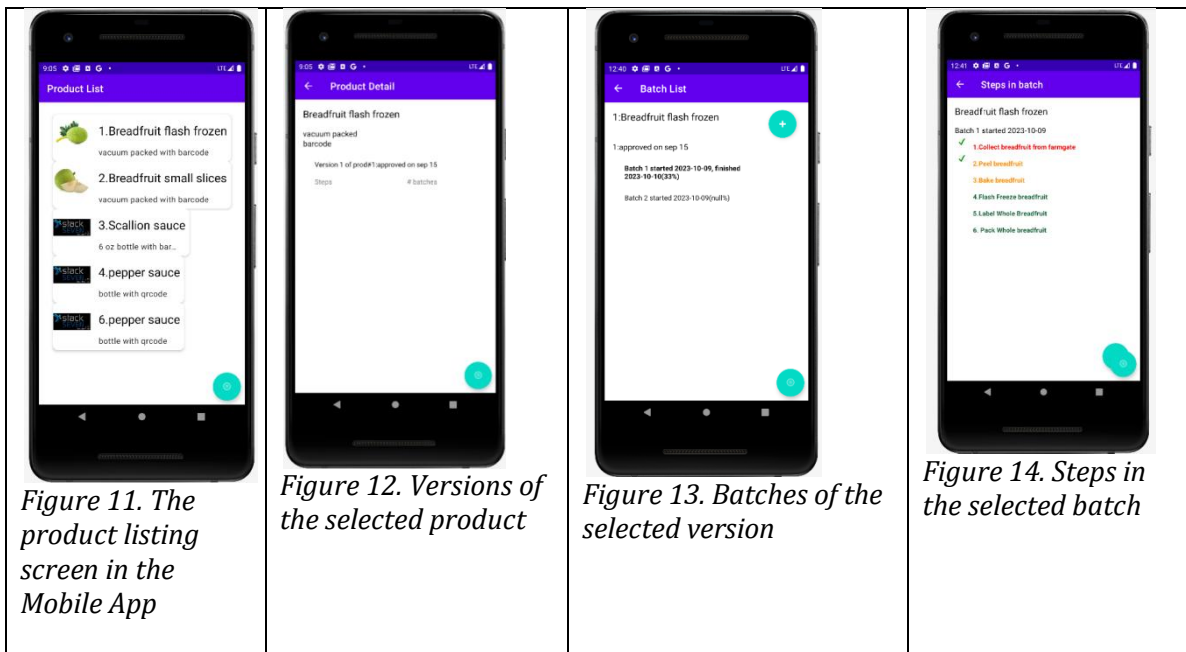

Figure 14. Confirmation requested after adding , removing or reordering steps

After entering the required version, the product reverts to the prior version.

CHAPTER 2. UPDATING PRODUCTION DATA WITH THE APP

The mobile app allows information to be managed on a device with a portable form factor. The initial screen shows a product listing (Figure 11). On clicking the product of interest, a list of versions is presented(Figure 12). On clicking the version of interest, a list of batches is presented(Figure 13). On clicking the list of batches, a list of steps is presented(Figure 14). The steps are colour coded based on the number of hazards that are associated. Steps that have no hazards are posted in green. If there is one hazard, the step is shown in orange. If more then one hazard, the step is shown in red.

Product listing in the App

Figure 11. The product listing screen in the Mobile App

Figure 12. Versions of the selected product

Figure 13. Batches of the selected version

Figure 14. Steps in the selected batch

Note that a checkmark is placed next to a step if actual data has been recorded on a sep.

When a step is clicked, the detail entry screen for a step is shown*(See Figure 15).* Users are asked to confirm their user name, indicate if the risk is low, medium or high, and optionally give a reading on any device that was used. A user can then enter a new hazard, and save it. (Note Broken Bottle has been added). If "On batch" was clicked, Broken Bottle would be added just for this batch, if On Step was clicked, Broken bottle would be saved as a hazard on the step for future batches . Clicking the blue plus sign to the right of a hazard allows a measure to be entered. After typing into the box and pressing enter, the hazard is saved on the device*(figure 16)*. When the save button is clicked, data on the device is sent to the server, where it will be available for the general purpose interface.
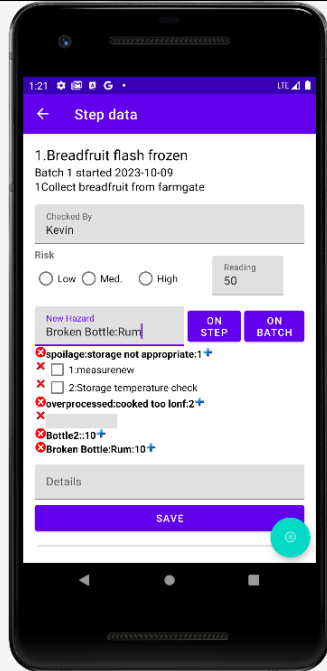
Figure 15 Details of a Step, that allows a new hazards to be added, either just for the batch, or for all batches on the step.
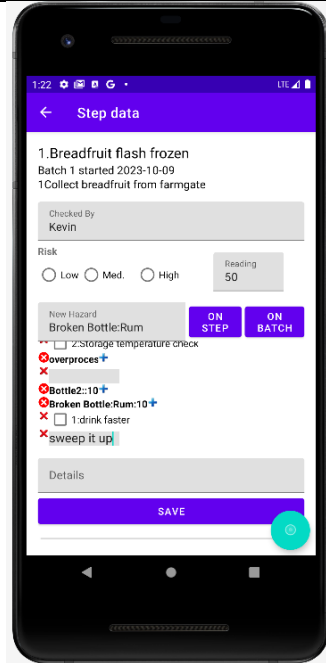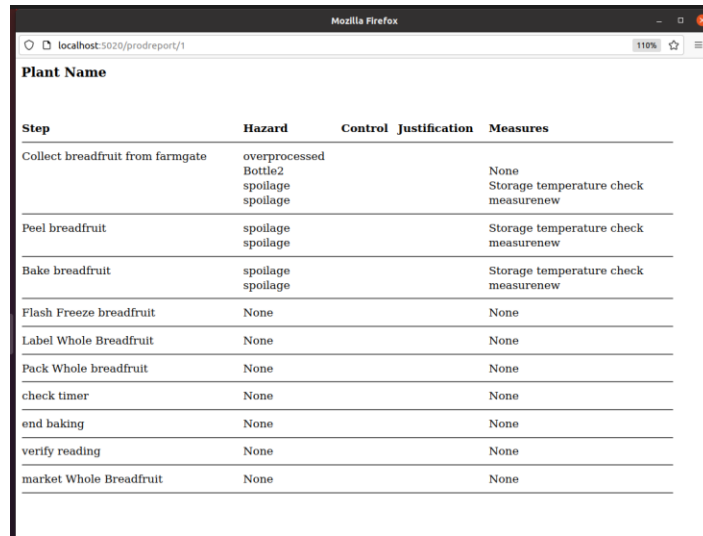

Figure 16: Adding a measure on a hazard.

CHAPTER 3:REPORTING ON THE HAZARD MANAGEMENT PLAN

Two main reports are generated by this system. The first is the StepHazards report for a product. The report lists, for the selected product, , each step, the associated hazards, and any preventative measures. This report can be useful for planning, or to seek approvals. See Figure 10 for a draft layout of the report.

Figure 10. The general Step Hazard report for a product (This gives a general plan, there also is a report per batch based on past production records)

The second report provides detailed historical records of previously created batches of product.