Business Process Analysis of

Water of Life’s City Link Food Warehouse

University of LaVerne

BUS 675: Management of Business Operations

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Business Process Analysis of CityLink Food Warehouse

Project Overview

Water of Life is a non-denominational evangelical church located in the city of Fontana. The CityLink food warehouse is one of the many programs the church operates to support and give back to the community. This paper presents an analysis of Water of Life's CityLink process flow of distributing food to families in need. The main objective of this operational analysis is to closely examine each step in the process to distribute food to the families in need, to identify areas of improvement and to suggest recommendations that will improve the process.

CityLink Business Overview

The Program Purpose

CityLink Food Warehouse is an extension of Water of Life Community Church whose mission statement is “A transformed life demonstrated by passion for God and compassion for people.” The food warehouse exist to be a Blessing to the local community both by the distribution of food as well as through the servant leaders who serve at the Food Warehouse offering practical help. The warehouse is a place where spiritual guidance is provided by listening, praying and ministering God’s word. Although Water of Life CityLink Food Warehouse is a smaller player in the food serving non-profit organizations, it has been a source of support to hundreds and hundreds of families.

The Service Promise

The CityLink Food Warehouse program opens every Tuesday and Thursday’s to qualified persons in need of food. The program offers one box/bag of food ("food basket") once a week per family. The food that is distributed to people in need tends to hold good nutritional value. According to Anna Ulibarri, Co-Director of CityLink, the principle of the CityLink Food Warehouse program is to provide functional food that is nutritionally balanced. This principle was recently implemented resulting in a food basket that consists of milk or juice, fresh vegetables and fruits, pasta, whole grain bread, and some snacks. There are no microwaveable items and no high calorie snacks included in the food basket. The contents have replaced the unhealthy food previously given such as chips and sodas. Anna also indicated that the program is working hard to target donors of good and healthy food to distribute.

Supply Chain

Water of Life is a non-profit organization which relies on donor supply chains to meet the needs of families in difficult situations. Water of Life Community Church has been in existence for over 20 years and has a very large church membership which provides for community service volunteer opportunities. The church has well established donor arrangements with Albertson’s, Target, Swiss, Lead the Way, Old Traditional Bakery, Post Brand Cereal, among others. Paid staff and volunteer members operate the transportation aspects of the supply chain management. The program utilizes three trucks on a daily basis to make pick-up runs to all the donor locations.
The donated items are taken to the CityLink food warehouse where they are inventoried and arranged for disbursement to families in need. Perishable items are stored in the walk-in refrigerator and are kept there until they are ready to be disbursed. Based on inventory levels, additional produce is sometimes purchased on Tuesday and/or Thursday mornings at wholesale cost to supplement the inventory based on forecast demand.

This supply chain design works quite well since they have a distribution system in place with well-established donors, warehouse storage, and trucks all accessible on a daily basis and within an hour’s drive. Also, Mr. Raul Sanchez and Mrs. Anna Ulibarri continue to develop long term relationships with donors that have lasted for over two decades.

Community Position

The main purpose of Water of Life’s CityLink Food Warehouse in the community is to build bridges for connecting neighborhoods in need and secondary to give a hand to families in need of help. Low-income families, handicaps and homeless are served every Tuesday or Thursday. The position in the community is central to the Christian believes of Water of Life Community Church. The warehouse is used as a means to not only help those in physical need but also support the spiritual fulfillment for both the recipient as well as the volunteer. The warehouse offers a great opportunity for Water of Life Community Church members to serve in ministering to the local community. CityLink serves as a bridge between the community and the church to worship, fellowship and learn the Word of God. Customers who have been served by food warehouse at CityLink are invited to pray in the prayer room. It is a place where everyone could feel love from God, and love from people.

Process Studied

The process studied was CityLink’s food warehouse operations during Tuesday and Thursday beginning at 2:00 PM and ending at 6:00 PM. This time window is the period where families in need are serviced and food is distributed to already registered family in need members. While the numbers of days and time slots open appear to be relatively small, the number of families in need serviced is quite large as evidenced by the amount of families served. Last year alone “over 82,000, boxes of food were distributed from the Water of Life Food Warehouse.” (CityLink website). To properly evaluate the process, the team volunteered as servants on Tuesday February 10, 2015. The process was observed and experienced during the volunteer time period. An additional site visit was made for the purpose of data collecting and follow-up frequent communications with the warehouse manager, Mr. Raul Sanchez, as held to properly evaluate the flow of families in need during the open time periods. The following sections provide the process description narrative and the process flow chart.
Process Description Narrative

Family Registration Procedure –

In order to make sure every family in need receives enough food, a procedure has been recently implemented to track total households that are signed up into the program. The program allows for one family visit per week (either on Tuesday or Thursday) and tracks a family by physical address submitted during application for assistance. To verify physical address, two forms of proof are required. The forms of proof can be government documentation (i.e., license, passport, or state issued Identification Card) and a utility bill or rental agreement showing the individual’s name as the person responsible for payment of the bill. This documentation is obtain during the individual’s first time visit when the application for assistance is processed. This first time visit occurs on Monday, Wednesday, or Friday which are days when food disbursements are not made in order to ensure food disbursements occur timely. The address can only be used once to ensure multiple family members do not register as different family members. Qualifying family member’s will be assigned a barcode which is use to register their weekly visits and assigned the day which they are to visit the warehouse for food disbursement (either Tuesday or Thursday). The member is instructed to bring a basket, box or bag(s) to use for food disbursement.

Weekly In-Processing Procedure –

Tuesdays and Thursdays are the designated days for families in need to obtain a food “basket”. People show up and are allowed to form a line outside CityLink’s Food Warehouse 15 minutes before doors open. Doors open at 2:00 PM and the first hour is dedicated to processing registered handicap and/or people with special needs which may require more time to move through the in-processing line. All other registered members are processed beginning at 3:00 PM. When the doors open, ten people are initially allowed into the lobby where they are in-processed. When the number of people in the lobby reduces down to three, seven additional people are allowed into the lobby for in-processing. This cycle continues on until the doors are closed at 6:00 PM. In essence, the kanban signal is three people left in the waiting chairs in the lobby.

The use of a bar code that can be scanned allows for expedited processing during the weekly visit as all pertinent information is already loaded in a database and the bar scanner eliminates the need to fill out any additional paperwork. According to Mr. Raul Sanchez, the use of the bar code has resulted in eliminating extremely long lines that previously resulted in significant delays to in-process people in need. Following implementation of the bar code, approximately 450 members are processed each Tuesday and Thursday in an expedited manner.
Once the members scan in utilizing the bar code provided during the family registration process, the member is given one of two different colored tickets depending on the member’s requirements. Members who do not have a refrigerator are provided a yellow ticket while people who do have a refrigerator are provided a blue ticket. As the member moves through the line in the lobby, the tickets are handed to the CityLink individual (usually a volunteer sitting at the control table near the warehouse entry door) who manages flow of the carriers or “runners” that assemble the food baskets. Once the ticket is handed to the CityLink individual, the member is afforded an opportunity to provide an optional contribution or offering and then proceed to place their baskets, box, or bag(s) in the designated area. Yellow ticket members leave their baskets, box, or bag(s) at the control table while blue ticket members place theirs against the wall in front of the control table.

Prayer Procedure –

Because CityLink is operated by a faith-based organization, the Food Warehouse includes a prayer room. While the member is waiting for their food basket, the member can go into the prayer room where trained prayer staff can listen to member and pray to the Lord Almighty to address their needs. From a strictly food service perspective, this portion of the process would be a non-value added activity. The process requires space, resources and creates potential confusion regarding food hand-off at the end as the runner cannot readily locate the individual if the individual went into the room for prayer. However, since this is an integral part of the reason why CityLink food warehouse exists, it cannot be eliminated. The issuance of a different color ticket should be considered for those seeking prayer so that the runner knows exactly where to find the individual at the end of the process to deliver the food basket.
Food Basket Construction Procedure –

Volunteers ("runners") take baskets, boxes, or bag(s) from the designated areas and proceed into the warehouse to fill with the food products. The volunteer walks to the back of the warehouse where the heavy items (juice and dairy milk products) are kept. These items are loaded into the food basket first to ensure less heavier items are not squashed. The volunteers continues up the assembly line adding items to the food basket with the last item added consisting of bread. A complete list of the food provided during the site visit consisted of the following:

- One 64 oz. juice
- One dairy milk product (1 liter)
- Five packages of dried shrimp
- One can of beans (22 oz.)
- One box of pasta or spaghetti
- One cauliflower
- Two large Choy
- Five green bell peppers
- Two bags of celery
- Five containers of gelatin (strawberry)
- Five small fruit containers (peach)
- One bottle of salad dressing
- One large salad bag
- Five small bags of croutons
- Five small bags of chips (hot flaming)
- Seven bananas
- One bag of old-fashioned cookies
- One French bread
- One bag of sliced bread

Food Disbursement Procedure –

Once the food basket is fully assembled, the volunteers head out of the food warehouse towards the lobby where the members are waiting. Once outside in the lobby, the volunteer meets the member and hands off the food basket or drops off the basket in the prayer room if the member sought prayer service. Some members require additional assistance with the food basket if the basket is too heavy for the member. In these circumstances, the volunteer walks the food basket to the member’s car. The volunteer must be at least 18 years of age to walk the food basket to the member’s car. The food disbursement is completed once the food is handed to the member in the lobby or taken to the member’s car.
Registered Member Arrives to CityLink Food Warehouse (Tuesday and Thursday Only)

- Stand/Wait in Line?
  - Yes: Leave
  - No: Enter lobby when called and start In-Process using bar code

Member

- Refrigeration?
  - Yes: Give Member Blue Ticket
  - No: Member completes In-Process, hands ticket, empty food basket/box/bags and optional contribution to CityLink Volunteer at Control Table

Member in Lobby?

- Prayer?
  - Yes: Wait in lobby for food basket
  - No: Member drops off food basket in prayer room

Runner picks up basket/box/bags and head to the back for juice and dairy products

- Reefer?
  - Yes: Runners continue up the assembly line adding food items into basket/box/bags
  - No: Runners meet member in lobby

Member in Lobby?

- Assistance to car?
  - Yes: Runners/Prayer service volunteer carries food basket to member's car
  - No: Member leaves with food basket
CityLink’s Food Warehouse Layout

Water of Life Community Church has setup the Food Warehouse, Administration building for CityLink services, the Mobile Medication building, Training Center and Thrift store in a commercial zoning area that is close proximity to residential homes. The CityLink Food Warehouse is located between commercial buildings as shown below in Figure 1.

![Figure 1: Water of Life Community Church CityLink Services.](image1)

Currently, handicap individuals have a pre-specified timeframe set aside from 2:00 PM to 3:00 PM for food distribution. All other qualified members can visit to pick up food beginning at 3:00 PM. When people show up, a line is started in the outer lining of the building fifteen minutes before the warehouse officially opens its doors for the day. Upon entering the facilities visitors check-in and provide a bag or box and are helped as soon as a volunteer can get to them.

![Figure 2: Water of Life Community Church CityLink Services.](image2)
Although there are a variety of food items offered, every visitor receives the same quantity of each of those items, except removal of some items for members with no refrigeration. This enables the warehouse back room to operate in an assembly line manner.

The volunteer takes the bag and enters into the back room. This is where all the food items are stored and is in an upside down "L" shape. The beginning of the bagging process starts at the back of the room and moves in a straight line up the assembly belt straight back to the doorway that leads into the waiting room. The other portion of the room, the back side area, is where the crates and boxes of food that are delivered from the donors are stored. The warehouse layout is shown below in Figure 3.

The heaviest food item, such as milk/juice containers and canned items, are at the beginning of the bagging process. Then the volunteer makes it up the assembly line to end at bread and cookies. Behind the assembly line there are other volunteers that are replenishing the food boxes as needed and assist the baggers by directly handing the specific quantity of each food item. Upon completion the volunteer steps straight through into the waiting room to call for the visitor to retrieve their bag. Then the volunteer starts the process over again by picking up a new bag to start filling up with food.
Data Collection

The service rate of CityLink’s Food Warehouse was studied to identify the minimum number of volunteers needed to support operations and determine the number of members processed during the time periods that are opened. The single day data collected was assumed to be representative of everyday the warehouse is opened and used to estimate the capacity level of operations. This assumption was verified to be appropriate by the warehouse manager, Mr. Raul Sanchez. The data consisted of the number of member’s processed during each 15-minute time period, as shown below in Figure 4, and used to identify how long it takes to complete the processing a single member once they enter the lobby area. The cumulative totals as time passes are shown below in Figure 5. The data was also used to determine what it would take to improve the service rate at peak member processing time periods.

![Figure 4: Members processed each 15-minute time block](image)
An analysis of the collected data showed that the total estimated time it takes to process a member with a handicap condition is approximately eight minutes while the total estimated time to process a member without a handicap condition is approximately two-and-a-half minutes. This time is dependent on a number of factors which includes the level of service provided and the needs of the member. The data collected shows a clear correlation that the number of members that could be completely processed from start to finish in a 15-minute time period is highly dependent on the number of volunteers available during the time period. In essence, the number of volunteers available is the bottleneck in the food disbursement process. Given the number volunteers that show up at 1:30 PM (call time for volunteers), the average number of members that could be processed every 15-minute time period and the capacity throughput can be easily determined. On a per “runner” basis during the 2 PM to 3 PM time period, a single “runner” can accommodate less than two handicap members every fifteen minutes. This number increases to six members every fifteen minutes after 3 PM.

When doors open at 2 PM, the volunteers know if they will be burdened over normal capacity based on the maximum number of “runners” that are available. This number is determined to be the total number of volunteers less eight, which is the minimum number of volunteers required to assist with controlling the waiting line outside, scanning the bar codes, managing flow control in and out of the warehouse, and stocking the food product as the “runners” fill up the food baskets. Shown below in Figure 6, are the average number of members that need to be handled on a per “runner” basis to sustain the line flows usually experienced.
While CityLink’s Warehouse operation is a non-profit service, it is similar to a manufacturing process with known production schedule (450 members served) and predictable throughput rate (based on number of “runners” available). The throughput capacity can be increased by simply finding more volunteer “runners” to meet the demand. Figure 7 below provides the capacity utilization corresponding to a six, eight, and ten “runner” scenario.

Figure 6: Average number of members per runner to support usual line flow

Figure 7: Capacity utilization under different “runner” scenario to support usual line flow
Recommendations

Capacity Planning

One concern in the current first-in-first-out (FIFO) operations at CityLink’s food warehouse is the variations in traffic from 2pm-6pm. During a typical high volume time, the waiting area is filled to capacity (a maximum of 10 people allowed in the lobby at a time) leaving others to stand in line outside. The families in need arrive more quickly than what the volunteers can accommodate resulting in a bottleneck. On the other hand, during a low volume period idle volunteers wait around leading to a low utilization of the resources. To better align utilization of the volunteer capacity and address the bottleneck problem in the process, our first recommendation would be to implement scheduled timing for the families in need that are picking up food. When setting up the qualified families they are assigned a barcode as identification that they are accepted into the program. CityLink can use the barcode system to assign a set time for when the family can arrive on a weekly basis to be served. It is estimated that approximately 450 members are processed each Tuesday and Thursday of which approximately 50 are handicapped. The time period between 2:00 pm and 3:00 pm is already set aside for handicapped individuals. The remaining timeframe can be separated into six 30-minute blocks and the remaining qualified members can be placed into one of these six groups. This would enable pacing the families in need by fixing the amount of movement in the distribution process to pre-determined amounts (i.e., fix the flow to approximately 67 individuals every 30 minutes). The recommended process of the groups following the handicapped time period would be as follows:

- First group: 3:00 pm and 3:30pm
- Second group: 3:30 pm and 4:00pm
- Third group: 4:00 pm and 4:30pm
- Fourth group: 4:30 pm and 5:00pm
- Fifth group: 5:00 pm and 5:30pm
- Sixth group: 5:30 pm and 6:00pm

Because the food warehouse receives big arrays of food donations, no matter what time a member arrives they will receive the same quality of food. The volunteers do a great job of ensuring the food donated is equally distributed to all visitors. The fixed timing will help pace the volunteers and workers to keep up the flow of bags/boxes that come through to be filled.

Throughput and Capacity Correlation

The experience of volunteering as a “runner” resulted in the observation of physical limitations to the platform used to place food products. Food products are placed on a platform comprised of rollers where the volunteer “runners” pick the food product from this platform to construct the food basket. The “runner” uses the same platform to support the weight of the food basket while food is added. As currently designed, the platform does not offer sufficient width for both the food product and the food basket making it difficult at times for the runner to construct the food basket. Our recommendation would be to increase the width of the platform. The room is spacious enough to accommodate an additional 4-5 inches which is estimated to be all that
would be needed to support both the food product and the food basket. This extension would help the volunteers place the bag/box on the platform and slide it through the assembly line at a much faster pace. This would increase the number of members that a single runner can accommodate thus improve time required through the assembly line to meet the demand.

Warehouse Optimization

Warehouse design and operation plays an elemental role in the whole supply chain system. The main problems at the CityLink warehouse is that the current architectural design and general layout impacts the storing of the food products used to stock the supply chain resulting in a greater response time to construct a food basket. The warehouse operations can be optimized by rearranging the layout thus eliminate wasted space. The back room is in an "L" shape, proper utilization of the space can be achieved by converting the straight lined assembly belt to bend to the shape of the room. The assembly belt should be slightly in the middle of the room, leaving enough space to store extra food items against the wall. This would allow for easy accessibility to replenish the supply chain faster in order to prevent a slowdown in the process.

Consider a Make-To-Stock Process

The current process in place is a make-to-order process. Food baskets are constructed when a member enters the lobby and is in-processed. Since the warehouse is only open for food distribution on Tuesdays and Thursdays, Mondays and Wednesdays could be used to pre-construct the non-refrigerated portions of the approximate 450 food baskets one day in advance. This portion of the basket represents approximately 80% of food basket. The remaining portion of the food basket would be constructed on Tuesday and Thursday. Volunteers currently serving as “stockers” could be reassigned to complete the food basket construction and roll the basket down the assembly line on the existing rollers towards the waiting room area where the “runner” can then transfer the food to the member’s basket, bags, and/or boxes. This process would eliminate 80% of a “runners” travel distance to construct each food basket as shown in the table below:

<table>
<thead>
<tr>
<th></th>
<th>Made-to-Order</th>
<th>Made-to-Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Runners</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Distance (ft.)</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Members Serviced</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>Average Member per Runner</td>
<td>56.25</td>
<td>56.25</td>
</tr>
<tr>
<td>Total Distance Traveled per Runner (ft.)</td>
<td>5625</td>
<td>1125</td>
</tr>
</tbody>
</table>

As can be seen, changing the process from a made-to-order to a made-to-stock would result in reducing 4,500 feet of unnecessary travel distance. In addition, completed baskets can be made ready on Tuesday and Thursday before doors open thus increasing productivity during the hours of open to the public operations. This reduction in travel distance and improvement in basket completions would result in increasing the number of members that each runner can service and would help transform the operations into a LEAN operation.
Volunteer Outreach

Water of Life is a non-denominational evangelical church and most of the volunteers are individuals that frequent the church. There are times the food warehouse is low on volunteer staff. To address this issue, we recommend CityLink to reach out to schools (high school and local university clubs) to increase the pool of potential volunteers by offering the opportunity to help serve the local community. By working directly with a university such as the University of La Verne (ULV), they will have access to volunteer clubs and theological organizations whose goals align similar to CityLink’s outreach program. An example would be Voices in Action, this is an organization at ULV that promotes communities to improve access to healthy and affordable food. There are also several clubs that highly promote community service as part of their core setup, such as ULV Bahai Club, Renew Christina Club and Catholic Newman Club. University students are the best aim for volunteers, they have more of flexibility to help volunteer during the hours of 2-6pm on Tuesdays and Thursdays.

Conclusion

Overall, the site visit to CityLink’s food warehouse and data collected has shown that the variation in traffic along with short staffing of volunteers is the bottleneck of the process. In particular, it is increasingly arduous during handicap and peak time periods. The total estimated time it takes to process a member with a handicap condition is approximately eight minutes while the total estimated time to process a member without a handicap condition is approximately two-and-a-half minutes. Our analysis of the visitor setup and volunteer bagging process has led the team to recommend systemizing the timing of the visitor's visit to a specific period. This will help control the inflow of orders and support a healthy and speedy outflow. We also recommended increasing the width of the assembly belt and rearranging it to fit against the outline of the room’s “L” shape. This would allow the volunteers to slide through the bags and boxes down the belt in ease and organize the inventory back stock of the food. Additionally, we recommended to consider changing the current process from a make-to-order to a make-to-stock process utilizing Monday and Wednesday as the days for pre-construction. This would eliminate unnecessary travel distance and decrease the time it takes to service a member. Lastly, we recommended to develop an outreach program through a local university, such as University of La Verne, to help gain more volunteers. There are several active clubs within the organization whom aim to assist the community through service. This correlates with the CityLink food warehouse purpose of giving back to people in need. Along with the similar service goal, the students currently at universities have flexible time schedule and are able to volunteer during the hours of 2-6pm on Tuesdays and Thursdays. With these recommendations, we believe that the member wait and order completion time can be reduced enabling more families to be accepted into and serviced by the program.
References


