

SUPPLY CHAIN MANAGEMENT STRATEGY FOR AN ENTREPRENEUR: HOW MUCH FUNCTIONALITY IS NEEDED?

Janis Warner

Christopher M. Cassidy

Sam Houston State University

Joe Whitehead

Tech-ER, Huntsville, TX

Kim McLerran

Small Business Development Center, Huntsville, TX

Joe Whitehead, a sole proprietor entrepreneur, had a thriving business repairing personal electronic devices in his hometown of Huntsville, Texas. Joe's Business, Tech-ER, earned an outstanding reputation among the community for timely, low-cost repairs of computers, smart phones, and tablets. His reputation was earned in no small measure due to his decades of experience and technical knowledge. Ironically, Tech-ER did not utilize an information system to manage supply chain or other business processes. Instead Joe kept all of the inventory and business information in his head. In the year leading up to 2019, his business had grown exponentially and he was struggling with the growing demands of his business in the supply chain, production, marketing, and customer service areas. He experienced several instances where he was out of the supplies needed for timely repairs and overwhelmed with customer relationship management. These problems threatened his reputation and therefore his business' future. To save his business, keep his outstanding reputation and keep the growth going, something had to be done. Joe knew he would have to fix the inefficiencies of his current processes which were holding him back and fix them quickly, but how?

Joe, the entrepreneurial founder of Tech-ER, had a thriving business repairing electronic devices such as computers, tablets, and cellular telephones. Located in the small town of Huntsville, Texas, Tech-ER had the benefit of a mid-sized university with 20,000 students and 4,000 employees, and the Texas Department of Criminal Justice with another 6,000 employees (City of Huntsville, 2020). With over twenty-five years of experience in repairing personal electronic devices, Joe performed all aspects of business operations, inventory, and supply chain management in an informal manner. He kept vast amounts of information "in his head". His business grew exponentially through 2019 to the point where he found it difficult to keep up with the growing demands of his business. The supply chain, marketing, and production tasks grew to the point where they overwhelmed him. He found himself increasingly out of supplies to complete repairs in a timely basis and overwhelmed with customer relationship management. Looking to the future, Joe wanted to grow his business, even thought of opening a second location, but the inefficiencies of his current processes are holding him back.

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The Local Market

Huntsville, TX was located about 70 miles north of central Houston. According to the US Census, Huntsville had a population of 38,548 in 2010, and a population forecast of 42,241 for 2019. The largest employers in Huntsville were the Texas Department of Criminal Justice (TDCJ), the Huntsville Independent School District (HISD), a state university, the Huntsville Memorial Hospital, and Walmart (City of Huntsville, 2020). See table 1 for top 10 employers.

Table 1: Major Employers in Huntsville Texas

Employer	# of Employees	Type of Product or Services
Texas Department of Criminal Justice	6,061	State Prison
Sam Houston State University (SHSU)	3,835	Education
Huntsville Independent School District	980	Education
Huntsville Memorial Hospital	477	Medical
Wal-Mart	317	Retailer
Walker County	380	County Government
Weatherford International	262	Oilfield Service
City of Huntsville	250	Municipal Government
Gulf Coast Trade Center	154	Education
Bayes Achievement Center	170	Education
Kroger	165	Grocery
Education Service Center Region VI	120	Education
Scott's Miracle Gro Company	50	Landscaping Supply

Source: <https://www.huntsvilletx.gov/704/Major-Employers> (City of Huntsville, 2020)

Evaluating the potential number of customers for a service like Tech-ER required the understanding that the census of population was highly distorted by two factors. Firstly, the population included over 10,000 inmates housed in five different Texas prisons - inmates who would never be local consumers. Secondly, the population failed to include approximately 16,000 locally domiciled students and approximately 2000 non-resident employees of Sam Houston State University (SHSU), who frequently interacted in the local economy. University students and employees typically used personal electronic devices more than the average small-town consumer, and were therefore most likely to be users of Tech-ER services.

Tech-ER

Tech-ER was located on the western edge of the SHSU campus, about a half mile from the center of campus. Tech-ER was founded in 2017 by Joe Whitehead. Tech-ER was Joe's second business but his first electronics business. Overlapping with his prior careers as a firefighter and educator, Joe had been repairing personal electronic devices as a side business since 1995. Joe was exceptionally good at repairing personal electronic devices. Repairing computers and phones was his hobby and passion. He described the need for a business like Tech-ER as:

“Huntsville needed a rapid but reasonably priced repair service for personal electronic devices. We had repair services but all were either slow or overpriced. Many were so highly diversified into networking, business services, or other high value but unrelated areas that they couldn’t do small scale repairs to cellular phones, pads, and computers in an efficient way.” (Whitehead, 2020)

Joel described the typical customer for Tech-ER services:

“Our customers are those people who need the case or screen of their cellular phone fixed but need their phone constantly and cannot afford to be without it for long periods of time. These customers can drop in and we will fix it while they wait. It takes as little as 30 minutes, usually less. We stock parts for the most common cellular phone models.

It’s not just students who smash the screens on their phones. Regular people drop their phones too. We get them fixed up fast and back to their busy lives.” (Whitehead, 2020)

Business Operations

During the first two years, Joe mostly worked alone running Tech-ER. He would have liked to hire help but was frustrated by undesirable experiences with every prior employee. Despite hiring employees with a technology background and experience repairing personal electronics, these employees were simply unmotivated or unhelpful. In Joe’s estimation, they cost more than they were worth. These employees did not seem willing to follow Joe’s business processes and policies. They seemed insistent on doing things their way. He even caught one employee stealing. As of December 2019, Joe was running the shop on his own from 11am-6pm, Monday through Friday.

Throughout 2019, the number of customers was growing rapidly. Joe found that local advertising did little to bring in customers, but word of mouth advertising worked very well. Satisfied customers told their friends, who in turn told others. Word of mouth advertising was especially efficient at the university, where students told other students about the best businesses in town.

“I can fix phones faster than any other repair service in town. And I’m conveniently located right next to campus. They can walk over to get their phones fixed in the in the hour between classes.” (Whitehead, 2020)

By the end of 2019, Joe was getting referrals from the other electronics companies. See table 2 for list of local electronics companies. He came to realize that the electronics market of Huntsville included several different companies each with different comparative advantages. One company specialized in digital computer controlled surveillance systems; one specialized in large networks, Joe’s specialized in quick service repairs to personal computers and handheld devices. Since each knew the talents of the others, word spread and each referred customers to

the provider with the comparative advantage. This way each electronics company could specialize and customers would get the best possible provider for their needs. Joe described the benefits of specialization:

“There are about five personal electronics companies in town. We are networked. Each of us is a specialist at something. If customers request us to do service work that others perform better, we send the customers to the specialist. It’s a win-win for us and the customer. It’s a better use of our time and the customers get better service.

There is one guy who is a “lone wolf”. He tries to do everything for everyone. We ignore him. He is not very good at anything and his prices are too high. Customers would be better off if they came to our network. Luckily for the customers, the “lone wolf” does not get much work.” (Whitehead, 2020)

Table 2: Huntsville Businesses offering “Electronics Repair” Services

Company Name	Services
Tech-ER https://techerhuntsville.com/	Mobile phone, tablet, laptop and computer repair
Ample computer Services https://www.amplecomputers.com/	Remove viruses and malware; Repair windows errors; Networking; Computer sales and service; Data recovery; Off-site backup; Business phone systems
Anthem Technology https://anthemtech.net/	Networking and full IT consultations; Security services, access control technologies, alarm systems
Xpress PC Repair https://www.xpressnetsolutions.com/	Repairs cellular phones and PCs; Software upgrades; Networking; Technical counselling
HelloTech https://www.hellotech.com/	Home theatre installation, IT services & computer repair, TV mounting
McCarty Electric https://www.mccartyelectricco.com/	Electricians; Residential services; Generator services; Video security system; Commercial construction; Residential construction; remodeling
Boost Mobile No website	Charging port repair; Glass screen repair; LCD repair; Digitizer repair; Headphone jack repair; Battery replacement

Sources: Multiple sources including Yelp.com, Yellowpages.com, Angieslist.com, etc., using search engines Bing & Google for “Electronics Repair” in Huntsville, TX.

Customers would bring cellular phones and personal computers with broken screens, cracked cases, and other broken components in for repair. Joe would test devices and replace broken components. For the most part, Joe replaced broken screens, cases, and switches with new original parts manufactured for specific brands and products. With the large number of brands and models, Joe could not keep inventory for every phone and computer. To speed up repairs for a job requiring parts that he did not have in inventory, he would scavenge parts from his stockpile. Over the years, Joe had acquired a vast and growing stockpile of working components salvaged from devices that were broken beyond repair. These components were stored throughout the shop on any available surface, in unoccupied corners, and sometimes in piles on

the floor (see Tech-ER Workspace photos in Figure 1). Inventory control for new original parts and his stockpile of salvaged components was managed entirely from his memory. Nothing was written down.

“I had a lot of valuable inventory, both new and salvaged replacement parts. I could see the piles growing every day. The problem was volume and organization. Inventory was taking up valuable space and it took valuable time to find what I needed. I did not know when I was running low on basic inventory items, so I didn’t know when to reorder in time not to run out. More and more often I scrambled to find the parts and pay extra for expedited shipping. I knew I needed to understand the value tradeoffs better so that I could make smart decisions about how much inventory to hold and when to reorder.” (Whitehead, 2020)

Figure 1: Photos of Tech-ER Workspaces (Whitehead, 2020)



Three photos of Workroom 1



Two photos of Workroom 2

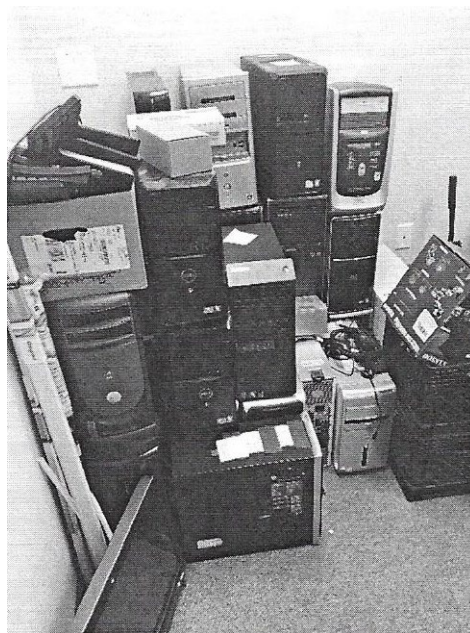


Photo of Back Hallway

Tech-ER's current financial and inventory system used QuickBooks Pro running on a PC with Microsoft Windows. Joe was neither a gambler nor risk averse, so any improvements had to avoid small chances of success and high risks of failure. Any improvements had to be quick. Joe had about \$3000 of available capital to invest in improvements. Limitations to improvements included the lack of time needed to make improvements and the lack of good staff. Although he previously had weak employees, he was not completely against trying again to hire good help. Improvements also had to balance long term risks with rewards.

Joe's Decision

Joe's reputation for quick and exceptional work was spreading throughout the region. No competitor could beat his turnaround time and service quality. For Joe, Tech-ER's performance was a matter of pride. He would not stand for anything less than the highest quality service and the best turnaround time. Customers sought him out from as far away as the Louisiana border, Dallas to the north, and Houston to the south. These successes strongly influenced Joe to consider expansion of Tech-ER to another location within the region.

As the end of 2019 approached, his biggest concern was sustaining his customer service, business growth, and stellar reputation. Although he was confident that his current service was still exceptional, he felt like he was operating at the maximum limit of his physical and mental capabilities. He felt like any increase in demand for his services would reduce the speed and quality of his service. Repairs took him longer to find parts among the workspace clutter and piles of salvaged components. Sometimes he even had to reorder parts he believed were buried somewhere in his shop. Uncertainty about the future caused Joe to feel like he was on the verge of some kind of catastrophe. It was as if he was "drowning in inventory and going down for the third time".

Despite the need to do something about his large, unorganized inventory, Joe felt paralyzed. He worried that radical changes might disrupt the careful balance he had achieved between managing the shop and keeping customers happy. He needed a better approach to interacting with customers, running the business, and managing his inventory or his business and his pride would suffer irreparable harm.

Among the various alternatives Joe considered to help him organize the business was purchasing an inventory management or Enterprise Resource Planning (ERP) system. He already used Intuit's QuickBooks at the front desk and knew it had inventory capabilities that up until now he had ignored. While he had not done any research on other software applications for small businesses, he generally understood the "functionality-cost" tradeoffs. He needed a system that was good enough but did not want to pay for functionality he would never use. He had to do some research to determine his software needs.

Before determining his software needs, he knew he first needed to determine and evaluate his business functions and processes. His advisor at the local Small Business Development Center had mentioned several tools for evaluating businesses including Rich Picturing and Weighted Ranking Analysis of alternatives. Perhaps those tools would also help?

Joe considered his goals for Tech-ER, as well as the specific inventory objectives he might try to accomplish. If he were to make changes, they had to be easy to implement and maintain or he would ignore them. He was anxious to find a solution. He had a gnawing suspicion that without changes, the combination of customer growth and inventory expansion would soon overwhelm him.

Should he make changes or do nothing? What should he do?

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