COMPUTERS, TAXIS, AND GRASS ROOTS TRANSPORTATION

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Royal Cab is a 40-year-old company. When we purchased the company in 1967, we had 6 cabs running and 11 available. The idea of people sharing a ride in our taxicabs started when we began operating the company, and so we have never had a problem about sharing a ride in a taxicab. Our problems have been some that I believe those in demand-responsive transit will be facing shortly.

When we bought the cab company, we wanted to serve the public and meet the demand for transportation. In our city of 125,000 people, there is 1 bus company, which is subsidized by the city, and 1 taxicab company.

As you know, if one has the attitude that something can't be done, it won't be done. When we bought our company, nothing could be done. I was told by the drivers, "You put more than 8 cabs on the road, and we'll quit you. If they want cabs, they'll wait." I was told that this was not a taxicab town, and, to tell you the truth, I very nearly believed them.

On the first day in business, I got there at 4 o'clock in the morning, exuberant about our new company. We had 3 time orders (a time order is an order that is on the books); we missed 2 of them because we did not get the cab there on time. We were really bad, and, consequently, nobody cared about Royal Cab, and nobody cared about public transportation. Fortunately, all transportation in our area was poor.

I was told that people would not ride cabs when the weather is warm, so when warm weather came we cut back even farther. I thought that these people sure had more knowledge about transportation than I had. I said that I would go along and listen to them, but after a period of time I would be able to show them statistics that would prove them to be wrong. They said, "Great! Go ahead!"

In July 1967, 5 or 6 months later, I told them that in no way were we responding to the public's need. "We're in a rut. Nobody's creative, and nobody's caring about the public. It's the public be damned, and I would like to change our image. I would like to start being responsive to what a person wants when he calls for public transportation." We then started using the Checker Cab, which looks like a 1927 box. It is a 7-passenger vehicle that had easy access and complemented our shared rides. We started to keep records on the number of "water haul" passengers (that is a passenger who is not there when the cab arrives). It was amazing how many we had.

At this point I started to look for a good dispatcher. We now have 3 dispatchers, who have a very nerve-racking job and an unbelievable capability to remember where a vehicle is. They are a rare, rare breed, and I knew we would have trouble finding any more like them. I knew, too, that, if our company was going to grow and if we were going to be responsive to the public's transportation needs, our dispatching program had to be implemented. I had no idea how.

Each of our dispatchers has a different personality and moods. When he comes to work after a lovely chat with his wife and a good breakfast then everything goes well. If he comes from an unpleasant situation, then all hell cuts loose, and, as a result, our service breaks down. I felt that there had to be continuity: the cab must arrive on time, every time; the driver working the cab must be treated the same every time; a new driver must get the trip, and time must be taken to "talk him through" to an out-of-the way street. We had to have this kind of continuity, and I think it is also going to play a large part in the success of the demand-responsive transportation program.

I felt that we also had to deploy vehicles better and earlier. I have heard many questions about how long after a call is made does it take the bus to arrive, or how long after a person gets on a dial-a-ride bus does it take to get to his destination. We have had this problem for years, and it has been solved by the ingenuity of the dispatcher who can route a cab driver through a maze of 29.5 square miles of roads so that he does not go more than 4 blocks out of his way as he moves through and picks up various passengers going in the same direction. If the passenger is going to work and cannot be late, the vehicle has to go sometimes with fewer passengers and in a more direct route. Our time from stopping in front of a house until the passenger gets out is much longer than the time reported for dial-a-buses. We feel very fortunate to get a person out in 1½ minutes.

I also felt that, if we could deploy our vehicles rather than "home" them (bring all of our vehicles to the downtown area), we could increase our efficiency. Today, after the last passenger is delivered, the driver stands by and gets further instructions to go on. This greatly increases gross revenue per mile and also makes the response time to the customer shorter.

We needed to grow with some kind of profit program, and that required that we look at the structure under which we worked. We had a taxicab driver on a commission rate taking all of his orders from a dispatcher on an hourly rate. Ninety-nine percent of all of our trips are radio dispatched; we have no cruising and pickup situations. So, if the dispatcher did not like the way the driver parted his hair, if he mumbled a little bit over the radio, or if the driver did not hear the dispatcher right away because of a bus or truck going by, the dispatcher might get mad and the driver might not make so much money. And these things happened! We thought there must be some way to eliminate this kind of dictatorship over the drivers who are out there in the cabs trying to make a living. We wondered whether a computer could dispatch taxicabs.

I contacted the computer company, and, when its representative arrived, he looked at me (my office is just the size of a good latrine) and thought, "There must be a sale here for a typewriter and the company has sent over a systems engineer." I said, "Come on in and sit down." There was the most startled look on this man's face as though he were thinking, "Good God, what can you possibly want from me?" I said, "Do you think you can dispatch taxicabs with a computer?" "Oh yes! What's your problem?"

Well, we had problems for him that he never knew existed. And all of a sudden he went from a very quick "I can handle it" to "Hold on a minute, we had better have some meetings." We had meetings and more meetings and discovered that this dinky little cab company that had 21 cabs had this big computer company completely mystified.

I have a friend who is an industrial psychologist. I asked him to come over and observe our dispatchers. After he had watched them work, his remarks were, "They're machines! They don't make that kind anymore, and don't look for their replacements." The computer company representative also observed the dispatching. His reaction was, "This can't be true! It is abnormal." I said, "It may be abnormal, but that's what happens day in and day out."

A man that comes off a shift of dispatching taxicabs, whether it be 10 or 21, is like a zombie. He really is talking to himself. He has to settle down before he can discuss problems with his shift. A

dispatcher is under tremendous strain that becomes greater as business increases. There comes a point when he can no longer handle it. What we wanted the computer people to do (if they could and my money did not run out) was to combine the best of our manual operation, the best of the zone operation, the best of the manual dispatching, and the best of meter control.

Interpretation is very difficult as changes are made. I have always found it to be extremely difficult and continue to find it so. First of all, I am a little younger than most of my drivers, and they know transportation much better than I do. It is very difficult for them to realize that we went from 6 cabs to 21 cabs and are now heading for 40 and that they are making more money than they made when we had 6 cabs. Then if we throw a computer operation in on top of that, they will fight it because they do not understand what is happening.

We did an in-depth study with our drivers. An in-depth study with a taxicab driver is beautiful. Before doing so, you have to learn points 1, 2, and 3 and learn them well, for if you skip point 2 and go to 3, he will bring you right back to it. No matter what is being discussed, he wants to know what it does to him and his pocketbook and why. He may also be afraid of losing the dispatcher because many times he may blame his doing a poor job on the dispatcher and he does not want that excuse taken away. We, therefore, had to have a good rap session with all the people who are running and directing our organization so that they would realize that the computer is not a replacement for them but an implementing tool that will take a tremendous load off of them. The computer does its job steadily day in and day out, and the performance rate of the driver can then be evaluated. He can be shown in black and white that his gross revenue per mile is down. He will not be able to say, "The dispatcher ran me in circles all day long." So with the computer, we get continuity, we get good deployment of our vehicles, and we are starting to get a management program together that attracts other people.

We had a very difficult time convincing the computer people that we required a fairly large computer. The type of equipment we started with requires 17 overlays. We do not have instantaneous response. The wait period is too long, and we realize we are going to have to go to a larger computer. We have alienated a lot of people in our break-in time. You can't imagine what a lady says to you when she calls and you very politely explain that she is being dispatched by a computer. She is very much aware that her cab has not arrived and does not want any jazz about a computer. We have made a lot of mistakes, but we have not backed off from the program because we know it is the best program for public transportation. We handle people; we handle packages; we handle anything that is involved in transportation. The difference between a taxicab in Davenport, Iowa, and a bus is the spelling.

We keep our gross revenue per mile up because we do not allow a cab to cruise. A taxicab driver sits until there is another trip for him or the dispatcher deploys him to another position. Now, the computer has to be the dispatcher and be able to relocate cabs.

I would like to say something about complications of routing with the computer. If the street runs diagonally, a dispatcher is aware of it and does not try to circumvent a driver around a lake or something to pick up a trip just because he is in the area. Most of our 940 streets are grid streets, but others go off at an angle. We have been able to program

them all into the computer by calling the angle streets exception streets.

Let's take a look at what really happens. The order is typed into the computer, including information such as origin, destination, number of people, and special messages such as wheel chair or package. The computer searches a file for a taxicab closest to this pickup point, that is either going or can go in that direction. The profitability criterion then determines which of several cars heading in that general direction will gather more revenue per mile by taking this trip, and that cab gets the trip. The computer has a load factor built into it, and so we never overload a cab.

I would like to close by saying that we felt compelled to try to put together a computer program that other cab companies operating 15 to 150 cabs on a 24-hour basis could use and also afford. We are open 7 days a week, 24 hours a day. We need to have continuity so that the man who closes his tavern at 2 o'clock in the morning gets the same response, the same ride, and the same time delay, if there is any, as the man who closes his shop at 4 o'clock in the afternoon. You have to have a people awareness and a supply and demand awareness to make this work.

I really believe this is grass roots transportation. It is not the airlines. It is not the trains. It is grass roots transportation. The problems can be solved and the demand can be handled with the right management.

INFORMAL DISCUSSION

Question: What percentage of your overall cost is allocated to dispatching?

Answer: We hope it is 5 cents per trip cost for computer use.

Question: Do your drivers get any pay for waiting at stations, or do they just get paid for trips?

Answer: Yes, he gets paid for waiting at stations. We charge 10 cents a minute after a 3-minute wait. We also charge 25 cents for more than 3 packages of groceries. To make sure the driver carries those bags, we allow him to keep the quarter. We share waiting time with him because it is taking our time, but anything that is received for manual labor is his.

Question: Do you have figures on computer benefits versus costs?

Answer: Yes, I have some gross revenue figures. In 1967, we were getting 18 cents gross revenue per mile. That is a loser any way you look at it. We brought that up to 32 cents with manual dispatching, and our last computer figures were 44 cents.

Question: What is your average trip cost?

Answer: As a zone company, it is approximately $1.18. We hope to lower that by increasing fares, and only in the taxi industry can you do this. We have sat around so long and done nothing that a price increase can look like a price decrease if handled properly. In the computer, we went from a base zone of 75 cents to a zone anywhere in the city of 50 cents. Yet, our gross revenue per mile picked up. So, needless to say, the people were happy. They were riding cheaper. The ones that were paying more were the ones that went a long way.

Question: How many cabs can the dispatcher handle?

Answer: I think the number of taxicabs the dispatcher handles can be quite large, but the number of trips per hour bogs him down. We find that, if there are

more than 110 trips an hour, he is lost because he cannot double trips.

Question: How many trips can a computer handle?

Answer: It depends on the size of the computer. In simulation, we have run as high as 200 trips an hour.

Question: Do you have a good backup system?

Answer: Yes, it is called manual. We have a large map that is incremented out, and we feel we could manage if we should have that breakdown.