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**Mobile Data Computers; A Feasibility Study for the
Flower Mound Police Department**

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**An Administrative Research Paper
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ABSTRACT

The Town of Flower Mound is located in southern Denton County, five miles north of Dallas/ Ft. Worth International Airport and has a population of approximately 60,000 people. The town has tripled its population in the last ten years. The town has been in past years mostly residential with few businesses, resulting in a lopsided tax base. During this time of tremendous growth the police department has fallen behind in the area of computer technology. Recently the town has placed an emphasis on bringing new businesses to town to level the tax base. With the added revenue the possibility of upgrading and adding new technology has become more feasible. The purpose of this research is to determine if the addition of Mobile Data Computers will enable our officers to perform their duties at a higher level, thus enhancing the level of service to the citizens of the Town of Flower Mound. The question to be answered is do the pros outweigh the cons for the Flower Mound Police Department to purchase Mobile Data Computers. The computers will allow officers to be more productive, they will increase officer safety and because communications will be able to dispatch via the computer system there will be a marked decrease in unnecessary radio traffic during critical incidents. There is a tremendous upside to acquiring a mobile data computer system. The increase in productivity, response time and faster information retrieval alone makes it worth considering. There are also obstacles that must be overcome before implementing a Mobile Data Computer System. These barriers include but are not limited to the cost of the hardware, software, airtime, system upgrades and other technical issues. Other considerations are training officers to use the system, ergonomics and computer viruses. These things must be addressed before implementing the system. The biggest obstacle to overcome is to obtain the funding for such an expensive project when there are other areas that government entities must give equal funding and attention. The research indicates that the pros do outweigh the cons when it comes to purchasing a Mobile Data Computer System. The system will allow our officers to deliver a higher level of service to the citizens through enhanced performance in the field.

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INTRODUCTION

The Town of Flower Mound is located in southern Denton County, five miles north of Dallas/Fort Worth International Airport and has a population of approximately 60,000 people. Flower Mound is bordered by Highland Village to the north, Grapevine to the south, Lewisville to the east, and Interstate Highway 35W to the west. The town encompasses approximately thirty-five square miles of city limits, which is patrolled by the Flower Mound Police Department. The police department has an authorized strength of sixty-seven sworn officers. The town has tripled its population in the last ten years. During this period of tremendous growth, the department has fallen behind in the area of technology.

While the town and the police department have tried to keep abreast of current trends and technology, the funds have not always been available due to other pressing needs. In past years the town has been mostly residential with few businesses, resulting in a lop-sided tax base. Over the course of the last two years, the town has placed an emphasis on bringing businesses into the town to level the tax base. With the added revenue, the possibility of upgrading and adding new technology has become more feasible.

The purpose of this research is to determine if the addition of Mobile Data Computers (MDC) will enable our officers to perform their jobs at a higher level, thus enhancing the level of service provided to the citizens of the Town of Flower Mound. The research question to be examined is do the pros outweigh the cons for the Flower Mound Police Department to purchase Mobile Data Computers? The methods of inquiry intended to be used in this research are professional publications, trade magazines, the Internet, and a survey of the thirteen metroplex police agencies the Town of Flower Mound uses for comparison purposes.

After completing the research, the intended outcome is to show that the addition of Mobile Data Computers will accomplish several things. First, the computers will keep our officers on the street for a longer period of time during shifts. Officers will be able to complete reports on the computer in the field and will no longer have to be in the station to gather forms or complete arrest reports. The computers will allow the officers to be more productive by being able to run computer checks on persons and vehicles from the patrol car.

Another problem the computers may minimize is the amount of radio traffic during times of heavy call load. Communications will be able to dispatch officers via the computer system, which will reduce the amount of radio traffic. Investigations will be faster and more productive with the computers. The officers will have collect information through having access via the internet and will be able to retrieve more information in a shorter period of time.

Finally, it is anticipated to find that the addition of the computers will increase officer morale. The cities bordering Flower Mound all have Mobile Data Computers. A recent survey of the officers assigned to the patrol division indicated the addition of the computers was a high priority. Although the purchase of the Mobile Data Computer System may have a heavy impact on the Town's budget the increases in the level of service provided to the community and the speed at which investigations are completed along with other daily tasks will offset the cost of the computers.

At the completion, the findings of this research will be presented to the Town Council of Flower Mound for consideration on purchasing the computers. The benefit of this research is not limited to the Flower Mound Police Department. Other agencies considering implementing Mobile Data Computers may also benefit from the information presented.

REVIEW OF LITERATURE

Computers have been in police vehicles since the mid 1970's when departments such as Las Vegas, Nevada; Kansas City, Kansas; and Van Couver, British Columbia pioneered their use (Chu, 2002, p. 118). The first computers were Mobile Data Terminals and while these computers were considered high technology, they had limited power and could not handle the applications we take for granted today such as word processing (Chu, 2002, p. 118). In the early 1990's agencies began using Intel based processor computers that used the DOS and later Windows operating systems (Chu, 2002, p. 118). This began the P.C. era of police mobile communications. While it has been over a decade since the P.C. era began, there are still many police departments that do not have this technology installed in their vehicles. When trying to determine whether to implement this technology, each department must examine the issue thoroughly to decide if the pros outweigh the cons as it relates to the feasibility of purchasing and installing this technology.

The intent of this research is to examine this issue and decide if implementing this type of technology is feasible for the Flower Mound Police Department. The first issue to be examined is the benefits of incorporating this technology and how the computers will help the officers better serve the citizens. The issue of officer safety is of great concern in law enforcement. Departments are continually striving to find ways to help their officers stay safe in the course of their duties. MDCS can enhance officer safety. By having access to immediate and accurate information, the officer in the field is in a safer position when dealing with subjects on a daily basis (Field Use, 1995). Recovering accurate and timely information is a reoccurring theme in reference to officer safety issues. According to Marshall (1998), an officer is safer when provided with timely and accurate information. Careless (2002) further states that the kind of

data the officer receives in the field can help save his life and an informed officer can better deal with the public, especially today when the media is watching and recording every move the police make. These similarities are striking and lead to one conclusion; the retrieval of accurate and timely information is essential in ensuring the safety of the officer on the street as they serve the public on a daily basis. The Mobile Data Computer achieves this objective and enhances officer safety.

Another area of concern for the police is in incident management. In the post 9-11 environment, the need to communicate with other agencies and disciplines is critical according to Careless (2002). "As 9-11 proved police and other public safety professionals have enlisted an awful new world of manmade catastrophes. In this horrific environment, fast coordination is key, as is the quick flow of information between dispatch and officers in the field." In direct correlation with Careless is the ALERT or Advanced Law Enforcement & Response Technology program, which is being performed by the International Association of Chiefs of Police along with the Texas Department of Transportation, the Texas Transportation Institute and the U.S. Department of Transportation (ALERT, 1997). This program has found that the ALERT system, which is an in-car mobile data terminal, can be used to advantage in situations that require communication between police, fire, and emergency medical services. By communicating via the computer system, information can be shared between different agencies and resources can be sent to the scene faster, thereby decreasing the amount of time needed to handle an incident (Alert, 1997).

Another area in which Mobile Data Computers will be helpful is field access to reference materials such as polices, directives, penal code, traffic code, and in-house records such as

reports and traffic citations. Officers will have access to these sources of information at their fingertips and will no longer have to be in the station to reference these materials.

Another area of advantage that practitioners point to is dispatching calls for service via the computer system and the ability of officers to keep in touch with headquarters and one another (Marshall, 1998, p. 9). This capability is essential during critical incidents as it allows officers to communicate while leaving the radio open for emergency communication (Marshall, 1998, p. 6). Another benefit of equipping patrol units with MDCS is that officers run more computer inquiries on driver's records, vehicle registrations, and wanted persons and property files than without the computer in the vehicles (Marshall, 1998, p. 6). This increase in information, as stated earlier, can help save an officer's life in the field, as informed officers are better able to protect themselves from threats (Careless, 2002, p. 204).

The addition of Mobile Data Computers will aid agencies with solving report problems by helping them better manage their forms and creating paperless reporting from the field. The use of MDCS may save officers time by decreasing the amount of time required to prepare incident and offense reports (Guidelines, 1996). Reporting via the computer system will further allow the officer to spend more time on the street as they will send their completed report to the supervisor for review and approval. After approval, the supervisor will transmit the report to the records section. These reports being transmitted electronically keeps the officers on the street and out of the station giving them more time to complete other tasks (Field Use, 1995; Careless, 2002). Forms management is more easily accomplished by using MDCS. With the report forms being in the computer, changes to the form are made easily. The forms are updated automatically without having to print and distribute new hard copy forms (Field Use, 1995). This saves time and money on associated printing and distribution costs. The computers are also

easily integrated with the existing computer equipment in the department. If a department has an internal computer system for in-house inquiries or is using a computer-aided dispatching system then MDCS can be integrated with these existing systems. This will be the case in the Flower Mound Police Department as the department already uses a computer-aided dispatching system and uses desktop computers for in-house communications and Internet access.

Another important function the computers will help to facilitate is the sharing of information across different jurisdictions. This sharing of information requires systems that are built for sharing. The affected systems include but are not limited to, communications frequencies, data definitions for physical descriptions, integrated geographic databases and any other operational data system that can be shared with other departments (Field Use, 1995).

The computers will further aid the officers in the field by allowing quicker information retrieval. The officers will be able to access state and national databases via the computer to run checks on driver's licenses and wanted persons. The officers will also have access to the Internet where they can use computerized versions of local directories to retrieve telephone numbers and addresses. They will also have access to departmental records and intelligence files. With this ability, officers in the field will have faster access to more information, which will keep them safer and make them more productive (Field Use, 1995).

The Mobile Data Computers will also serve as a morale booster for officers. Studies have shown officers are more aware of their surroundings because of the ability to run computer checks on vehicles while in the field. Officers were also noted as saying they enjoyed going to work each day because the in-car computer system helped break up the daily routine and some officers would report for duty early to ensure they received a vehicle that was computer

equipped. Officers also believe they were making more quality arrests with the computer system than without. (Marshall, 1998)

While there are many reasons to acquire computer technology for use by officers in the field, there are also many concerns that need to be addressed before a department commits its time, resources, and energy into a project of this magnitude. The first obstacle that must be overcome is the acquisition of funding for the computers. The computers and software needed to implement this type of program is expensive and requires a considerable monetary investment by the department. Here are also reoccurring costs associated with the computer system such as airtime, communications systems upgrades, and software and hardware upgrades. Computer technology changes at such a rapid pace that keeping up with these changes presents a unique challenge for departments to find the funding for these changes (Field Use, 1995).

Another obstacle to computerization is making informed decision by the department concerning computers and software. There are so many different computer brands and software packages on the market today that departments considering computerization need to be sure they have the expertise required to make informed decisions concerning the system they are wanting to purchase. Departments that have an Information Technology Department can avoid this pitfall (Field Use, 1995). Departments must also consider what type of computer hardware and software other departments in the area are employing. Most departments only consider their own needs when deciding what computer system to buy. If the system is to be effective in combating regional crime problems, then it must be compatible with the systems used by other area departments (Field Use, 1995). The system must also be upgradeable and a plan for system design and upgrades must be established. The plan will assist departments without an IT department ensure their system remains current.

Another obstacle to implementation is that departments often are forced to deal with computer vendors that are not aware of the role the computer will play in a law enforcement application. Because of this, departments are sometimes saddled with systems that are better suited for other uses (Field Use, 1995). Along with this, education and training of all employees from senior management to the street level officer plays a vital role in the success of the newly implemented system. Without extensive training, the system is bound to fail or be less effective (Field Use, 1995).

The literature also brings forth the issue of ergonomics and officer safety. One of the most notable downsides to installing MDCS in police vehicles is the increase in the number of fleet accidents which are caused by officers attempting to use the computer while the patrol vehicle is in motion (Dees, 2003). As to the question of ergonomics, the positioning of the equipment in the patrol vehicle and the proper installation is crucial to the issue of officer safety. The equipment must work in the space provided and great consideration must be given to the already installed safety features of the vehicle such as driver and passenger side airbags (Field Use, 1995).

The possibility of the computers being infected by a virus is another downside of which to be aware and knowing what precautions to take to protect the system. Dees (1999) states the latest threat to computer data is maliciously written mobile code, which is included on the web pages and as attachments to email messages. Dees further says that some anti-virus software can detect the problem mobile code and catch it, but system managers can prepare for the problem by limiting the types of applications accessed via the web, installing firewalls, and regularly updating anti-virus software.

The last obstacle that a department planning to implement MDCS should be aware of is the time, priority, and space problem. The fact is that most governmental entities whether they are state, county, or municipality will find it difficult to sign off on such a large ticket program for a department when there are other infrastructure issues that demand attention and funding (Field Use, 1995).

METHODOLOGY

The purpose of this research is to determine if the addition of Mobile Data Computers will enable the department's officers to perform their jobs at a higher level, thus enhancing the level of service delivered to the citizens of Flower Mound. At the completion of this research, it is anticipated that the addition of the computers will accomplish several things. First, the computers will keep officers on the street for a longer period of time during their tour of duty. This will be accomplished because the officers will be able to complete their paperwork on the computer in the field and will no longer have to be in the station to gather forms or complete arrest reports. Second, the computers will be able to run their own computer checks from the car and not have to go through dispatch. The third problem the computers will solve is the amount of radio traffic during times of heavy call load. Because the computers are in the cars, dispatch will be able to send officers to calls via the computer system thus reducing the amount of radio traffic leaving the radio clear for emergency and high priority transmissions. Fourth, investigations will be faster and officers will be more productive. With the computers, officers will have access to the Internet and be able to retrieve more information in a shorter period of time because of not having to go through dispatch for information such as addresses and telephone numbers.

The method of inquiry for this research was accomplished by a review of professional publications, trade magazines, the Internet, and finally a survey of the thirteen-metroplex police agencies the Town of Flower Mound uses for comparison purposes. The measurement instrument for this research was a telephone survey of the police agencies used by the Town of Flower Mound for comparison purposes. The survey sample was of the thirteen police agencies and the scope of the survey was to determine if the agency utilized Mobile Data Computers and if so, what brand of computer and software was used, and who provided the air time for the agency. All thirteen agencies were cooperative with the telephone survey and provided the requested information. The information obtained will be used in this research to show that Flower Mound is the only police agency in the comparison pool that does not utilize Mobile Data Computers and also to determine which brand and software is most widely used by agencies in the comparison pool.

FINDINGS

Computers have helped law enforcement agencies better serve their citizens. Computers have been utilized in police vehicles since the 1970's. The first computers were Mobile Data Terminals (MDTs) and although they were cutting edge technology for their time, they were limited in power and could not handle applications such as word processing (Chu, 2002). Beginning in the early 1990's departments began using personal computers in police vehicles thus the P.C. era of police computers began (Chu, 2002). Research has identified that Mobile Data Computers have enabled police officers to be more efficient and effective in their daily duties. One area that MDCs have helped officers is in the area of officer safety. With the Mobile Data Computer, officers have access to immediate and accurate information concerning

the subject with whom they are dealing. This places the officer in a safer position while conducting traffic stops and detaining suspects on a daily basis (Field Use, 1995).

Another area in which computers have proven valuable is in Incident Management. In this era of manmade catastrophes, it is essential that Police, Fire, and Emergency Medical Services be able to communicate. In this environment fast coordination and the quick flow of information between dispatch and officers in the field is key (Careless, 2002). Mobile Data Computers allow for the quick flow of information between different disciplines and make coordination of resources easier and gets the necessary equipment to the scene faster, thereby decreasing the amount of time it takes to handle a major incident (Alert, 1997). Research further indicates that in-car computers are very helpful to officers who can access reference materials in the field. The computer can hold policies, directives, penal and traffic codes and in-house records such as reports and traffic citations and any other reference materials that may be needed by the officer in the field. Because this information is at the officer's fingertips, there will no longer be a need to carry cumbersome books and allowing officers to remain in the field to reference these materials. Dispatching via the computer system will minimize the amount of radio traffic during times of heavy call load and is especially important during critical incidents. The ability of officers to communicate with each other via the computer system will leave the radio open for emergency traffic (Field use, 1995).

Another area of advantage is the ability of officers to run their own computer checks on vehicles and persons. The research has shown that officers run more inquiries with the in car computers. (Marshall, 1998). It has also been shown that this increase in information in the field can promote and improve officer safety. The officer receives the computer returns faster than they did going through dispatch and better-informed officers in the field are better able to protect

themselves from threats (Careless, 2002). Along with this, another important factor in implementing the Mobile Data Computers is the creation of a paperless reporting system (The Police Chief, 1996). Officers are able to write reports on the computer and when completed, send it to their supervisor via the computer system. The supervisor can then check the report and send it on to the records section or back to the officer's computer for correction. Reporting via computer allows the officer to spend more time on the street as they will write all their reports on the computer in the car rather than spending time in the station typing reports on a P.C. (The Police Chief, 1995 & Careless, 2002).

Forms management is an important reason for having Mobile Data Computers. Report forms and other paperwork are downloaded into the computers for officers to use in the field. Changes and updates to the forms are more easily accomplished. The forms are updated automatically, which decreases costs associated with having to print and distribute new hard copy forms (The Police Chief, 1995).

Integration with existing computer equipment and systems is another plus for implementation. The MDC system can be integrated with an existing in-house or Computer Aided Dispatching system. The computer will further assist with communications across different jurisdictions. In order to share information with other departments, each department must ensure that the computer system they intend to purchase is compatible with systems already being used by other area departments (The Police Chief, 1995). The addition of Mobile Data Computers will aid officers in the field by allowing quicker information retrieval. Not only will officers have access to state and national Law Enforcement databases, they will also have access to the Internet. This is important because officers will no longer depend on dispatch to locate information for them. Instead, they will locate the information for themselves via the Internet

and departmental records and intelligence files. Having direct access to this information will allow for faster retrieval and allow officers in the field to be more productive (The Police Chief, January 1995).

The research points out that the in-car computer system will serve as a morale booster for officers. Studies have shown that officers who have access to computers in the field are more aware of their surroundings because of their ability to obtain information via the computer system. Officers also enjoyed going to work each day because the computer system helped break up the daily routine. Officers also reported for work early to acquire a computer-equipped vehicle. Officers further believe they made more quality arrests with the computer system. (Marshall, 1998)

There is a tremendous upside to acquiring a Mobile Data Computer system. The increase in productivity, response time, and quicker information retrieval alone make it worth considering. However, equally important is the downside associated with the purchase of such a system. There are many obstacles that must be overcome before the system can be implemented. The hardware and software needed to begin this type of program is expensive and will have a heavy impact on most departments' budgets. Other things to consider are airtime, communication system upgrades, and software and hardware upgrades. Computer technology changes at such a rapid pace that to keep up presents a challenge to most departments to find the funding, to finance the costs associated with such a program (The Police Chief, January 1995).

Another pitfall to avoid is deciding what computer to use. There are so many different brands of computers and software packages on the market that departments that are not computer savvy may have a difficult time making an informed decision. Departments that have an Information Technology department can rely on their expertise. Small departments may want to

consider hiring a consulting firm to research the system and make recommendations or can deal directly with a vendor. Great care must be taken when dealing directly with a vendor because the vendor may not be aware of what role the hardware and software will play in a law enforcement application (The Police Chief, January 1995). Departments going this route are advised to check other departments in their area and seek out recommendations for computer systems utilizing law enforcement applications and credible vendors.

Education is a key ingredient in the success of a new Mobile Data Computer program. Every employee from the top of the organization to the bottom must be trained on the computer system. Without proper training of all employees, the newly implemented system is bound to fail or be less effective (The Police Chief, January 1995).

A problem the research does bring to the forefront is the increase in the number of fleet accidents. This increase in accidents is caused by officers attempting to use the computer while the vehicle is in motion. This problem is easily overcome by purchasing a voice interface for the computers. The voice interface allows officers to keep their attention on their driving while receiving computer returns. The interface reads these returns to the officer thus leaving the officer free to focus their attention on more important matters (Dees, 2003). Officers must remember this is a read back system and care should be taken while entering information via the computers keyboard.

Ergonomics is a key issue. The positioning of the equipment in the vehicle and the proper installation of said equipment is crucial to the issue of officer safety. The after market equipment such as radio, radar, consoles, etc. must not interfere with the already installed features of the vehicle such as airbags. (Field Use, 1995) Computer viruses are another problem departments must be prepared to deal with. Officers using e-mail or going to Internet

websites to obtain information are making their computers susceptible to being infected by a virus. This problem can be dealt with by using firewalls and by installing and updating anti-virus software (Dees, 1999).

The last and possibly the largest obstacle a department must overcome in implementing a Mobile Data Computer system is the time, priority, and space problem. Most government entities are hard pressed to purchase such a costly item for a police department when there are other areas and issues that demand equal attention and funding (Field Use, 1995). A possible solution to this obstacle is by identifying grants that can be used for technology. In this post 9-11 era, there are federal, state, and corporate grants that can be used to purchase a Mobile Data Computer system. These grants can help offset the cost of the in-car computer system and aid departments that would otherwise not have access to this technology.

In this, the early part of the twenty-first century, use of computers in patrol vehicles is wide spread throughout the metroplex and most departments are currently taking advantage of this technology. To illustrate this point, a phone survey was conducted of the thirteen-metroplex cities The Town of Flower Mound uses for comparison purposes. The survey showed that all thirteen cities surveyed indicated they have Mobile Data Computers in their patrol vehicles. The chart below shows the cities surveyed, what software is employed and what system each department utilizes for airtime.

CITY	MDC's	SOFTWARE	SYSTEM
Allen P.D.	Yes	Intergrated Computer Systems	AT&T
Carrollton P.D.	Yes	Electra Com	AT&T
Colleyville P.D.	Yes	Aether	AT&T

Coppell P.D.	Yes	Radcom	Lease from Lewisville P.D.
Denton P.D.	Yes	Vision Aire	CDPD
Frisco P.D.	Yes	Intergrated Computer Systems	AT&T
Grapevine P.D.	Yes	Vision Aire	AT&T
Lewisville P.D.	Yes	Vision Aire	Have their own 800 trunk system
McKinney P.D.	Yes	Windows 2000	AT&T
North Richland Hills P.D.	Yes	Windows 98	Tiburon unitex based dispatch tool
Plano P.D.	Yes	Windows 2000	Have their own 800 trunk system
Richardson P.D.	Yes	Vision Aire	AT&T
Rowlett P.D.	Yes	Vision Aire	AT&T

Further research showed that the cities of Highland Village and Grapevine, which border Flower Mound along with Lewisville, also have computers in their patrol vehicles. This survey indicated the Town of Flower Mound is behind other departments in the metroplex in the area of computer technology.

CONCLUSIONS

The Town of Flower Mound has experienced tremendous growth in the last ten years and has fallen behind other departments in the metroplex in the area of computer technology especially as it relates to Mobile Data Computers. The purpose of this research is to determine if the addition of Mobile Data Computers will enable officers of the Flower Mound Police Department to perform their jobs at a higher level, thus enhancing the level of service provided to the citizens of the town.

The research question to be examined is do the pros outweigh the cons for the Flower Mound Police Department to purchase Mobile Data Computers? The research shows that MDCs will accomplish several things. The computer will keep the officer on the street and out of the station. Everything the officer needs during his tour of duty will be in the computer. Items such

as report forms, law books, policies, directives and any other forms or reference material will be available at the touch of a button. Officers will be more productive and safer because they can run their own computer checks on persons and vehicles from the car. Radio traffic will be minimized during heavy call load times and critical incidents because communications will be able to dispatch calls via the computer system keeping the radio free for emergencies. Officers will be more productive because they will be able to collect information from the Internet and will be able to retrieve more information in a shorter period of time. The computers will also serve as a morale booster for the officers. The research addresses the morale issue and shows that officers enjoyed coming to work everyday because the computer helped them do their jobs better (Marshall, 1998).

The major obstacles in implementing a Mobile Data Computer Systems are cost, lack of expertise, and coordination with other departments concerning hardware, software, upgrades, education, training, ergonomics, and officer safety. Most of these obstacles can be overcome; however the major obstacle is the funding for the computer system. Grants help offset the cost of the computers and associated items; however, cities must be willing to earmark funds to pick up where the grants leave off.

After examining the findings it is clear that the pros do outweigh the cons for the Flower Mound Police Department to purchase the computer system. The findings and conclusions of the research support the hypotheses. The benefit of this research is not limited to the Flower Mound Police Department. Other agencies considering implementing Mobile Data Computers may also benefit from this research.

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