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# AN ASSESSMENT OF THE LEAD SYSTEMS INTEGRATOR CONCEPT AS APPLIED TO THE FUTURE COMBAT SYSTEM PROGRAM

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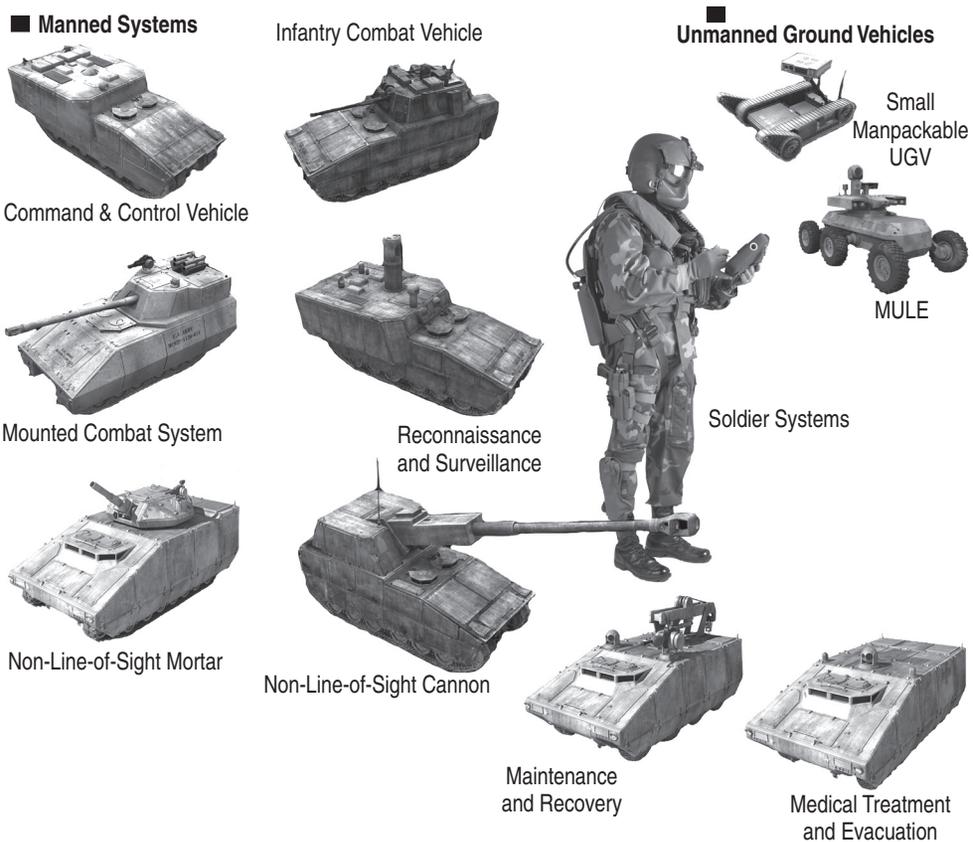
On October 12, 1999, the Chief of Staff of the Army, General Eric Shinseki, delivered the keynote address at the Association of the United States Army (AUSA) annual symposium in Washington, D.C. In this momentous speech, he shared his vision for transforming the Army, with the goal of making the Army's forces "light enough to deploy, lethal enough to fight and win, survivable enough to return safely home...and lean and efficient enough to sustain themselves whatever the mission." The vision called for an immediate off-the-shelf solution—which became the Stryker Brigade Combat Team—to "stimulate the development of doctrine, organizational design, and leader training" as the Army began to develop new technologies to field the objective force (Shinseki, 1999). A short time later, the Chief of Staff gave the Army its mission: build and field the first Unit of Action, equipped with Future Combat Systems (FCS), capable of full spectrum operations, by the end of 2010. The Army's response to this challenge was to initiate a revolutionary acquisition program that utilizes an innovative system development paradigm called a Lead Systems Integrator (LSI).

**T**his article provides an assessment of the Lead Systems Integrator (LSI) concept, now that it has been in use for nearly 3 years on the Future Combat Systems (FCS) program. It will not assess the progress of the FCS program, any of its pros and cons, nor the outlook for its future. This article will also avoid any quantitative or qualitative measures of how the chosen contractor team has been performing as the LSI.

Rather, it will examine the idea of using an LSI on the FCS program, attempt to find the pros and cons of the concept, and offer recommendations should the Department of Defense (DoD) decide to implement this methodology on future weapon system acquisitions.

## METHODOLOGY

Data for this assessment was gathered via document research and interviews. The authors conducted interviews with representatives from across the FCS program, including senior Army officials on the Department of the Army staff, Army representatives from the FCS program office, and other Army personnel from supporting organizations. We also interviewed officials from the LSI, and from their lower-tiered equipment suppliers. Because of the National Defense University’s strict non-attribution policy, any comments referred to in this article, directly or indirectly, will not be attributed to individuals who were interviewed during the research for this article.



**FIGURE 1. CONFIGURATION OF FCS SYSTEM OF SYSTEMS<sup>1</sup>**

## CONCEPT DEVELOPMENT

In order to meet the aggressive timeline laid out by the Chief of Staff, the Army formed a partnership with the Defense Advanced Research Project Agency (DARPA). The DARPA had the capability of using contracting instruments that were more flexible and responsive than those available to the Army. The Army/DARPA team enlisted the help of industry in a structured, multiphase program. In Phase I, four industry consortia teams were formed. These teams were each comprised of organizations and businesses from across a wide spectrum. There were representatives from traditional Army contractors combined with some whom had little or no experience with Army weapons systems. Some teams also had members from consulting firms and academia. The teams were provided funding by DARPA to come up with a conceptual design to meet the Chief of Staff's vision. For the FCS program, this was the Army's first utilization of contractors to do what had traditionally been done organically. Industry's rapid and thoughtful response set the stage for the future.

The results of these four independent studies were then used to develop the operational requirements for the FCS. The initial system configuration of the FCS contained nine manned ground vehicles, four classes of unmanned aerial vehicles, four different unmanned robotic ground vehicles, and numerous unmanned ground sensors, communications networks, and intelligence systems. The updated configuration, as of August 26, 2004, is shown in Figure 1.

Any of these systems would likely warrant an Acquisition Category (ACAT) I or II program by itself. Designing and developing all 20 of them, plus the network systems, in half the time normally allotted for a single system, created a daunting challenge for the Army acquisition workforce.

## WHY AN LSI?

During the requirements refinement period, program officials quickly recognized the monumental level of effort that would be required to integrate the functionality and operational aspects of all of the systems that would be needed to meet the requirements. These same officials also believed that the Army's acquisition workforce lacked enough people with the expertise to execute the systems engineering function in the timeframe and at the level required for the FCS program. Thus, the Army again turned to industry to provide the necessary "brainpower," in the form of an LSI. In the words of one senior Army official, "The basic nature of the [FCS] requirement lends itself to using an LSI" (Source #1, personal communication, February 23, 2005). His perspective was that the FCS acquisition takes major weapon system procurements to the next level of complexity, and using an LSI is merely taking the customary role of a prime contractor to the next level.

In a typical acquisition program, the Army would establish a Project Manager Office (PMO), staffed by government employees, that would be responsible for awarding and managing a contract to a prime contractor who would then be responsible for designing and building the weapon system. The government PMO would also oversee

the configuration control and systems integration, to ensure the final system delivered met all of the performance and configuration requirements. Applying this model to the FCS program, the Army would have established 20 separate PMOs, typically one for each platform of the FCS System of Systems (SoS), which would have awarded separate contracts to a prime contractor to develop their respective platform of the FCS system. The government would then have had to establish another PMO that would be responsible for the systems engineering and configuration control functions to ensure that each of the systems being developed through the 20 individual PMOs could network and function together. Simultaneously standing up and fully staffing over 20 separate PMOs and performing the systems engineering effort to integrate all of the various systems was a monumental task that exceeded the Army's in-house capabilities. Therefore, the Army decided that instead of following the traditional acquisition approach, they would utilize an LSI to develop the architecture for the SoS envisioned for the FCS, to perform the needed systems engineering and integration effort, and to orchestrate the procurement effort for each of the SoS platforms that make up the FCS program ("Lead Systems," 2002). The intended purpose of the LSI was to provide the systems engineering and management oversight throughout the development phases of the program, and be responsible for the delivery of the system-of-systems capable of engaging in net-centric warfare. From the start, the LSI was to focus on "systems engineering, systems integration, and systems planning and control to get the best of industry to work the hardware" ("Future Combat," 2002, slide 5).

In March of 2002, the Army and DARPA selected the team of Boeing and Science Applications International Corporation (SAIC) as the LSI for the FCS. At that time, the LSI approach was expected to afford opportunities to insert *leap-ahead* technology upgrades, incorporate best business practices, and to ensure an integrated effort from all concerned. The initial contract was valued at \$154 million, and was intended to last 16 months ("Lead Systems," 2002).

## ADVANTAGES OF AN LSI

The Army chose to implement the LSI concept on the FCS program because its leadership felt that "business as usual" would not work, and the LSI approach afforded many benefits that would be critical to the success of the program. The concept's two biggest advantages are its ability to fill in the personnel capability gap and subcontract management. Each will be described in detail below.

### PERSONNEL CAPABILITY GAP

The primary value of using an LSI for the FCS program was in the area of manpower. Several years of downsizing in the Army acquisition workforce, combined with an order of magnitude increase in the size and complexity of the program, created an immense capability gap between the amount of human capital available and what was required to execute the FCS program. According to one senior Army leader, "We don't have the personnel or the expertise" (Source #1, 2005). Another Army official thought,

“Industry has the expertise, and more knowledge than the government. The LSI can [acquire] better people faster than the government can. They can go out and get people who are the best, technically. [In this case,] they also hired several qualified people with military experience” (Source #2, personal communication, February 22, 2005).

The Army acquisition workforce has two components: active duty military personnel and Department of Army (DA) civilians. Each group has its strengths and limitations. The active duty acquisition corps can be relatively more responsive in changing positions and organizations, but there are barely enough acquisition officers in the corps to meet all of the current demands. Although the operations supporting the War on Terror had not yet commenced when the Army made the decision to use an LSI, the manpower drains that it caused across the Army would have widened the capability gap even further. The DA civilian cadre has a relatively larger number of talented individuals, but the personnel systems are not responsive enough to make the adjustments necessary to fill the capability gap in a timely manner.

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The Army personnel system is even slower and more cumbersome when it tries to acquire talent from outside the government. The first step, determining the right mix of functional expertise needed to tackle the FCS program, would probably not have been accomplished in a timely manner, as the Army has never attempted a program of this magnitude. According to one Army official, “Despite what we think, we don’t know how to do this” (Source #1, 2005). Then the recruiting, selection, and hiring of the right people would take even more time, assuming they were available and the Army could offer enough financial incentives to attract them to civil service. Even with the presence of the LSI drastically reducing the manpower requirements, it still took several months for the personnel system to staff the remaining positions in the FCS PMO. By some estimates, it would have taken 12-24 months to staff a PMO with enough qualified people to be able to handle the workload of the FCS program, if it were possible at all. Since the first major DoD-level milestone decision was scheduled for 16 months after the LSI contract was awarded, keeping the functions within the government would have made the daunting schedule impossible to meet from the start.

An LSI contractor could be much more responsive to the manpower needs of the FCS program by using human resources methods common to the private sector. They could use a combination of three methods to pull together expertise quickly. First, they have access to large populations of human capital to draw from to staff the LSI. The Army fully expected the LSI to be one of the larger defense contractor corporations.

As it turned out, the Boeing/SAIC team combined two very large corporations with substantial manpower pools, so this benefit was magnified. Second, they could implement the recruiting and hiring practices of a private entity, which can attract and hire talent much more rapidly than their government counterparts. Third, they have the ability to award and manage multiple large technical support contracts for supplemental manpower. Again, because an LSI is a private entity, they are not encumbered by the rules and regulations of the government contracting process. Therefore, they can issue and award subcontracts in a much shorter timeframe.

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One of the biggest obstacles to successfully meeting the aggressive timelines established by General Shinseki was pulling together enough manpower with enough capability to perform the thousands of systems engineering and integration tasks necessary to develop the complex SoS that was to make up the FCS program. The current state of the Army's acquisition workforce, combined with the processes and culture of its personnel system, rendered traditional staffing methods completely inadequate. The size, personnel flexibility, and indigenous expertise of the large defense contractors chosen as the LSI have mitigated this shortfall.

## **SUBCONTRACTOR MANAGEMENT**

The second area in which the LSI was expected to provide a tremendous advantage was in management of the subcontracting process. As described earlier, the initial configuration of the FCS had nearly 20 major subsystems, each of which would warrant a major acquisition program if they were procured separately. Because of the breadth of engineering experience and the depth of manufacturing capacity that would be required, no single contractor could possibly be expected to develop and produce all of these systems. Therefore, it was apparent that this program would need to use multiple subcontractors to have the ability and the capacity to build all of the systems in sufficient numbers.

The LSI contractor is not constrained by the contracting regulations and processes the government must use when it awards contracts (Source #3, personal communication, January 28, 2005). Thus, they can award contracts much more smoothly and quickly, and initiate work much sooner. In addition, the approval chain of command within a defense contractor is generally much shorter than that of a government organization.

Similar conditions also exist during the administration phase of the contract. In the words of one Army program official, “The LSI does a much better job of herding the cats than the government could” (Source #4, personal communication, February 15, 2005). The working relationships between the senior leadership of the LSI and its subcontractors are very conducive to accommodating change, much more so than the working relationships between typical government decision-makers and contractors.

## DISADVANTAGES OF AN LSI

As with any drastic procedural change in a large organization, the use of the LSI concept has presented some disadvantages and problems. During our research, two major problem areas stood out: organizational culture and organizational structure. Our discussions with officials involved in the FCS program found that these two areas accounted for the vast majority of problems experienced on the FCS program to date. In addition to these areas, program officials also discussed problems including erosion of Government expertise, greater program scrutiny, and potential conflicts of interest.

### CULTURE IS EVERYTHING

After compiling the data, it is clear that organizational culture has been the biggest impediment to success of the LSI concept on the FCS program. The use of an LSI is a new way of doing business, and as such it requires the right organizational culture to implement it effectively. Based on interviews with both government and contractor personnel involved with the FCS program, it appears Army leadership did not invest enough time to effectively develop and communicate the culture needed to properly implement the LSI concept. This could be because they didn’t feel the need, or they felt they had sufficiently communicated the culture, or they did not have the time to do so properly. To initiate change within an organization, the change must be fully supported by top management. During interviews with industry representatives associated with the FCS program, their perception was that the Army leadership did not fully support the FCS program. They saw that the Army’s senior leadership was more focused on the war efforts, and rightfully so. However, they also saw that senior leadership was focused on other Department issues instead of the FCS program, such as the Army’s transformation to a “Modularized” force. They interpreted this as the Army’s focus on buying capabilities that exist today rather than investing for those for the future. They also believed the Army had not fully funded the FCS program in the Army’s future budgets (Source #5, personal communication, February 23, 2005). Given that the FCS program will revolutionize the manner in which the Army fights its future wars, and that it is the single largest acquisition program ever attempted by the Army, industry personnel expected to see much more outward support from the Army’s senior leadership in implementing the LSI strategy (Source #5, 2005). Other indications have also highlighted cultural problems with implementing the LSI concept.

When the Army first announced its intention to implement the LSI concept on the FCS program, there was a lot of internal opposition to the idea within the Army. The

initial reaction by various organizations within the Army acquisition community was to attempt to “win” the LSI role as an “in-house” government-performed effort (Source #1, 2005). This clearly shows the lack of the culture needed to support this new way of doing business. Government agencies managing a program under the LSI concept must learn how to adapt to more of an oversight role as opposed to that of an implementer. This transformation to a new method of conducting business was also not effectively communicated throughout the acquisition community before implementing the FCS program.

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This change is exemplified particularly in the role of government Project/Product Managers (PMs). Government PMs have been trained to closely manage cost, schedule, and performance, and they have been empowered to direct the resources and initiate the required actions to successfully manage their programs. However, under the LSI concept, this responsibility is pushed to the LSI, and government PMs serve primarily in an oversight capacity to influence the program as needed. The LSI contractor now carries the responsibility and empowerment to manage cost, schedule, and performance. This role change has been a source of frustration for government PMs who feel they do not have a voice in managing their programs, especially at the middle and lower tiers of the FCS program (Source #4, 2005). For these individuals, most of who have been trained throughout their entire careers to be leaders, this has created a serious cultural dilemma. Instead of being placed into command positions and empowered to lead, they are now finding themselves placed in oversight roles with little authority to influence the programs they are assigned to manage. They are being asked to monitor and report, not lead. This is a drastic cultural change that was not communicated to nor understood by these individuals prior to implementing the LSI strategy.

Interviews with other Army organizations cited additional frustrations and concerns over adopting the LSI concept. In some cases, government personnel were hesitant to engage with the LSI over fears that their discussions with the LSI contractor could be interpreted as a change in the contractual scope of work (Source #2, 2005). Others cited that the contractual relationship with the LSI had created an adversarial atmosphere on the FCS program, instead of the cooperative atmosphere which was intended. All of these incidents point to a cultural problem on the FCS program, which supports the claim that the Army did not develop the right culture for the LSI concept to be truly effective. Changing its organizational culture to adopt the LSI concept will take

some time, but this reform is necessary if the Army is going to succeed in the FCS program (Source #1, 2005). In developing this cultural change, it will be important for the Army's senior leadership to lead the way in implementing the new culture. This will be necessary for the Army to accept the new paradigm and cooperate better with its industry partners.

This cultural dilemma is not unique to the government. Industry contractors participating in a program employing the LSI concept must also adopt the right culture. The LSI contractor must adjust their mindset from playing the role of a traditional defense contractor to that of being part of the government team. Discussions with government organizations and industry subcontractors participating in the FCS program have painted a culture of mistrust between themselves and the LSI personnel. Government agencies expect the LSI contractor to perform in the traditional manner in which the DoD has conditioned defense contractors. They are discovering, albeit after the fact, that the LSI underbid the contract and government officials are beginning to see metrics highlighting negative variances in performance, cost, and schedule that are being glossed over by the LSI (Source #4, 2005). The overall consensus is that instead of operating in the role of the lead integrator of the FCS "Team," the LSI appears to be operating with their own interests in mind. This is a profit-driven corporation, so this behavior should not be unexpected, nor vilified. Examples from interviews with government personnel note that the LSI contractor focuses on "winning the production prize" instead of being the program lead integrator (Source #2, 2005).

In other situations people have discovered differences between the performance requirements in the contract between the government and the LSI contract and the performance requirements in the contract between the LSI and its subcontractors. In numerous anecdotal instances, the performance levels imposed by the LSI onto their subcontractors are lower than the level of performance required by the government in its contract with the LSI (Source #4, 2005). Additionally, personnel from Government agencies have also claimed that the LSI is restricting access to basic information they would normally have access to had a government program office been performing as the LSI. They claim the LSI often tells them the data is property of the LSI and thus must be considered proprietary in nature (Source #2, 2005). These actions clearly point to the lack of a "teaming" culture between the Army and the LSI, one of the primary reasons for initiating the LSI concept.

Similar cultural problems have been noted between the LSI and its subcontractors, leading to a general feeling of mistrust between the two. Instead of viewing the LSI as part of the government team or program office, LSI subcontractors still view the LSI as a competitor (Source #5, 2005). The cultural problem between the LSI and its subcontractors is also a two-way street. There remains ill will among some of the subcontractors who were part of industry teams that competed for the LSI role in the FCS program and were not selected. Some continue to carry a grudge against the LSI, and have complained that the LSI has not passed on a fair share of the funding awarded in the LSI contract for the work that they have been contracted to perform. This was confirmed by representatives from the LSI's corporate office, who have stated that there is a general feeling of resentment against their company by their subcontractors (Source #6, personal communication, February 22, 2005). LSI subcontractors have also

complained that the LSI has been acting as gatekeepers, intentionally restricting the flow of information and access to government agencies that subcontractors believe they need in order to perform their functions. The subcontractors are accustomed to being prime contractors and having access to the government personnel and the information that comes with being a prime. They also believe the LSI worries that some of the subcontractors may try to sabotage the LSI concept within Congress in an attempt to discredit the FCS LSI paradigm and recompile it as separate contracts for each of the individual systems that make up the FCS program (Source #5, 2005).

Whether these allegations are true or not, this culture of mistrust exists and has taken its toll on the working relationships, undermining some of the advantages that might otherwise have existed if these conditions did not exist. For example, the LSI should be able to pull together the collective lobbying power of their large partners and leverage it to gain additional support for the FCS program in the Congress. Instead, the LSI has found that their subcontractors are unwilling to coordinate with them on Congressional lobbying because of the mistrust and competitive nature that exists between them (Ibid).

The cultural problems that exist within the Army, the LSI, and the cadre of subcontractors could have possibly been avoided or minimized with the proper groundwork to establish the right culture prior to awarding the LSI contract. There may not have been enough time to do it, but these cultural impediments exist nonetheless. Attempting to implement such a cultural shift at this point in the program will be very difficult given the environment of mistrust that has already been established. This is a lesson that the DoD should remember when applying the LSI concept to future programs.

## IMPLEMENTATION AND ORGANIZATION: PLANNING IS CRITICAL

Developing a strategy to implement a program of the magnitude of the FCS is absolutely essential for success. In this capacity, the Army spent a year developing the FCS acquisition strategy, and did an excellent job of assessing its own capabilities and determining that it needed an LSI to assist in managing such a large program. However, though it chose to use an LSI, the Army appears to have rushed into implementing its use without completing the initial planning necessary to ensure the success of the LSI strategy. Interviews with personnel from government agencies and industry contractors involved with the FCS program have uncovered several problems associated with implementing the LSI concept.

To effectively foster the proper program culture, an organization must also structure itself so that it can function effectively within the culture. With a program as large as the FCS, government agencies supporting the program would clearly be engaged throughout all levels of their organizations. Although the Army chose to use an LSI to perform the systems engineering and subcontractor management functions, the Army still needed to structure itself beyond the first tier of its organization to match up with their LSI teammates. However, based on interviews with personnel from government agencies, the LSI, and LSI subcontractors, it does not appear the Army has done so. Senior leaders within the Army acquisition community have observed this, as have LSI

subcontractors. In most cases the government agencies have not been able to organize themselves fast enough to match the LSI, nor have they been able to make decisions fast enough to keep up with the LSI (Source #1, 2005). In their view the implementation of the program is moving so quickly that they cannot effectively engage with the LSI. The Army wanted speed from the FCS program management team, but now that they have it, they may be overwhelmed by it. Thus, instead of being able to proactively influence the LSI and the FCS program, government agencies have been reacting as they try to reorganize themselves and catch up with the LSI (Source #2, 2005). Government and subcontractor personnel have experienced several instances in meetings in which the LSI staff grossly outnumbered the government staff; thus, the LSI staff were able to apply greater influence and control over the program. This has allowed the LSI contractor to dominate many portions of the FCS program, especially among the lower tiers of the program.

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Another shortcoming that has coincided with the lack of an adequate organizational structure on the government side of the FCS program has been the lack of sufficient communication channels. Lower-level project managers have been unhappy with the lack of direct communication channels to send issues up the chain of command for resolution. They often claimed issues were stifled by the LSI as a result of their control over the program (Source #4, 2005). In some cases, since the lower-level PMs do not have control over cost, schedule, or performance, their only means of surfacing issues – and getting leadership’s attention – has been to invoke the program’s risk management tool. While this method has been effective in communicating issues up the chain of command, the process normally takes 45 days to bring an issue to the surface. In a program moving at the pace of FCS, 45 days is far too slow. Personnel from other government agencies claim that many of the issues they raised up for resolution often get ignored or lost in the data shuffle due to the enormity and complexity of the FCS program (Source #2, 2005). These incidents indicate that the program does not have clearly established communication channels and this has hindered the ability to process and sort information up through the middle and top layers of the FCS program. The lack of an adequate organization structure, communication channels, and effective

control mechanisms have resulted in the Army giving up a great deal of control over the FCS program to the LSI.

Another function critical to the successful execution of a program is properly defining the program up front. During our discussions with both government and contractor personnel, every individual we interviewed stated that the Army did not invest enough time up front to define the FCS program specifications and LSI contractual statement of work to include the necessary checks and balances to retain proper government control of the program. As a result, the LSI has often taken advantage of contractual interpretations to seize greater control over the program.

An example of this is in the testing phase of the program. Lack of clearly defined test requirements in the LSI contract has resulted in considerable debate between the LSI contractor and independent government agencies with regard to who has control over conducting the preproduction and production qualification tests. The LSI claims they have control over conducting the tests based on their interpretation of the contract, and the government test organizations claim that they have statutory rights over independent testing. It would have been impossible to clearly define all of the testing requirements so early in the program, but the differing interpretations on both sides are causing conflicts (Ibid).

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LSI subcontractors have also stated that the Government's contract with the LSI is not defined enough, and that it lacks the checks and balances to retain control over the LSI contractor, both now and in the future (Source #5, 2005). In addition, government PMs assigned to oversee subcontracted portions of the FCS program claim they are struggling with deconflicting the government's contract with the LSI and the LSI's contract with their subcontractors. As stated earlier, some second- and third-tier PMs have noted that the performance requirements of the LSI's contract with its subcontractor do not match performance requirements in the government's contract with the LSI (Source #4, 2005). As a result, there is a constant struggle between the PMs and their LSI counterparts over which requirements are correct and should be enforced at the subcontractor level.

Many of the problems associated with implementing the LSI concept have been recognized by senior leadership within the Army acquisition community. In other

cases, however, these problems have been lost in the daily flow of information due to the enormity of the FCS program. Nonetheless, Army leadership still recognizes that 1) this is the first time the Army has implemented such a large scale program, 2) the program was rapidly put together in one year, and 3) this is the Army's first experience employing the LSI concept (Source #1, 2005). They have accepted the fact that the Army may not have worked out all of the bugs associated with using an LSI, and that there will be mistakes. However, the philosophy stressed by the Army acquisition leadership is that government organizations must learn from these mistakes, adapt and institute the needed changes to address these problems, and then move on with the program. There can be no turning back. The majority of these issues can be attributed to "learning curve" types of problems associated with implementing a new acquisition strategy. Nonetheless, with better up-front planning many of these implementation problems could have been avoided.

## IDENTIFYING OTHER PROBLEM AREAS

In addition to the cultural and implementation problems, there have been a number of disadvantages associated with the LSI concept. One of the greatest concerns noted by government personnel within the acquisition community is the erosion of skills and expertise in the acquisition workforce. If the government continues to utilize LSIs to perform systems engineering and program management functions, eventually these skills will erode and be lost to the government workforce. Some middle- and lower-tier PMs within the FCS program have quietly complained they have been relegated to the role of contract administrators (Source #4, 2005). In addition, mid-level managers within the government fear they will become more reliant on contractor expertise, and that they will lose the skill and experience needed to independently assess programs.

Programs using an LSI have also been subjected to greater scrutiny when compared to other DoD procurement programs. In the case of the FCS program, a recent series of unethical actions involving the LSI's parent organization has caused the program to be scrutinized much more closely by Congress (Source #1, 2005). Also, even though the LSI concept has been around for a short time, it is still considered new in terms of the DoD. As such, programs using the LSI concept have been subjected to closer scrutiny and skepticism within the DoD and Congress, simply because the LSI concept is different from the "traditional" DoD acquisition approach. In addition, the LSI concept breaks Congressional stovepipes. Because FCS is a single program, as opposed to a collection of 20 or more, its funding is delineated within the Army program using a single program element (PE).<sup>2</sup> This reduces Congress' ability to influence funding on a particular piece that may have local political implications for elected officials.

The use of an LSI has also introduced the perception of potential conflicts of interest within the FCS program. Contractors within the defense community believe the LSI caters to their preferred subcontractors by awarding them major portions of the FCS program, in order to avoid strengthening traditional and future competitors. Industry members have also complained that even though the LSI is supposed to operate independently of their parent or corporate entity, the LSI still has the opportunity to oversee the proprietary data of its chief rivals. Some LSI subcontractors have also

claimed that the LSI has not passed down additional funding associated with increases in scope of subcontracted work to its subcontractors (Source #5, 2005). Many of these allegations have been found to be untrue, but the perceived conflicts of interest have damaged the working relationships and have brought on additional unwanted scrutiny and attention within the DoD and Congress.

## CONCLUSIONS & RECOMMENDATIONS

The FCS program is unmistakably enormous. The key to managing such a large program is establishing a solid foundation of systems engineering expertise to successfully manage the integration of the numerous systems and subsystems that make up the overall program. The LSI concept is clearly the best strategy for this purpose. It has been debated both inside and outside the government whether or not the systems engineering and integration role should be performed by government or industry personnel. Despite these debates, the bottom line is that the Army is not capable of performing this role on the scale required for the FCS program. The Army lacks the human resources capacity, and the capability to structure, assemble, and staff an LSI organization in a short enough timeframe to manage a program as large and as fast paced as the FCS. In addition, its organizations are too stovepiped. Agencies would end up wrestling over control of their individual pieces of the program, and would not be able to recognize trade-offs against their subsystems to benefit the SoS approach that is the key to the success of the FCS.

Conversely, industry is better suited to organize, assemble, and staff an LSI organization quickly. Industry personnel know their supplier partners and personnel better than government organizations do. In addition, they also have the ability to hand pick and hire the talent needed to work the program, and the ability to attract and retain professionals in high demand career fields (Source #2, 2005). Industry organizations also bring with them institutional processes with respect to systems engineering, risk management, earned value management, and other information management tools that are far superior to those of most government organizations. More importantly, due to the competitive nature of the commercial sector, industry organizations also bring with them a culture that is more output oriented, streamlined, and efficient than most government organizations. Therefore, an industry team is best suited to perform the complex systems engineering and integration functions.

There are two key elements to successfully implementing the LSI concept on a government program. First, it is critically important for the government agency implementing the LSI concept to develop the right culture within its own organization, and to restructure itself to mirror the LSI. Otherwise the program will experience the same pitfalls the Army has had with the FCS program. Second, it is equally important to write a solid program specification and LSI contractual statement of work to define the program as much as possible, especially the roles and missions of the government and the LSI personnel. With a well written and well thought out program specification and statement of work, the task at hand becomes one of executing the “game plan” as opposed to searching for a way to achieve program success.

Most of the problems experienced by the Army on the FCS program can be traced back to problems associated with organizational culture, organizational structure, and lack of a properly defined program. It is important to note these problems are not caused by the LSI concept itself, but by improper execution of the concept. In the case of the FCS program, the Army is largely suffering from the learning curve effects of implementing a new way of doing business, which has been compounded by the size and magnitude of the program.

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***Most of the problems experienced by the Army on the FCS program can be traced back to problems associated with organizational culture, organizational structure, and lack of a properly defined program.***

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It is believed that all of the problems observed with the LSI concept on the FCS program can be resolved. The Army is taking steps to do this, but it will take time for the Army to develop the right culture, restructure itself to match up with the LSI, and to clearly articulate to the LSI what it is the Army wants them to do. The Army has not underestimated the problems associated with the FCS program. They recognize these problems are primarily learning curve issues, and they have committed themselves to working out the problems and moving forward with the program. With the nation currently at war, the Army is facing an enormous increase in demands on their fiscal resources. This trend is expected to continue into the future even after the Army withdraws its forces from Iraq, as it will then be faced with the need to recapitalize and/or replace a significant portion of its combat equipment. Army leadership has recognized this developing trend, and with it the need to change the way the Army does business when it comes to procuring large-scale weapon systems. The LSI concept may cost more to implement up front, but the long-term savings associated with the streamlined processes of the LSI will create significant savings in the long run. The Army has recognized it must change the way it conducts its business, because fiscal pressures on future defense budgets will demand it.



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## ENDNOTES

1. Boeing's 2005 FCS Briefing Book, p. 10.
2. There is actually more than one PE for FCS, but the total is much less than 20 and the preponderance of funds reside in only one.