

Adapting to 21st Century Change: A New Framework for Defining Military Capabilities

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Abstract

The US military must embrace new ways of shaping change in the emerging new era or it will fail to effectively advance military capabilities and attain the goals of *Joint Vision 2010*. Our research outlines a way of applying several proven management methodologies, using an objective-oriented framework and experimentation, to increase the effectiveness of military operations. A new Joint Mission Framework, an adaptation of RAND's strategy-to-tasks construct, plays a key integrating role in this new approach. Its output-based perspective is an intuitive one, facilitating advancement of military capability across the spectrum of joint military operations.

1. Introduction

Joint Vision 2010 (JV 2010) and its companion *Concept for Future Joint Operations (CFJO)* provide the initial basis for formulating and expanding the joint community's vision for the future. However, they still lack comprehensive processes to implement them and are at risk of becoming ineffective.

Technological advances and their implications will dramatically impact how well the US military can perform in the 21st century. Achieving the vision of full spectrum dominance demands

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dramatic changes on a scale never before imagined. To succeed in this environment of rapid, dramatic, non-linear change, the US military must evolve, adapt and continually learn faster and more effectively than ever before. This requires significant transformation in thinking and culture and renders traditional management approaches for channeling the energies of people and leveraging technology increasingly obsolete.

Faced with many of the same challenges, experts in the civil sector have developed new ways to cope with them. These are new, integrated methods that simultaneously evolve people, processes and technology, and many of them have achieved remarkable results. We propose that if the most successful of these (such as strategic visioning, use of ‘value streams’ and experimentation) were adapted and aggressively pursued, the US military could enhance its achievement of *JV 2010* goals.

We first introduce the *JV 2010* vision and its implementation and briefly discuss related industry efforts. Then we highlight important needs for change, most of them regarding command and control processes. Next, we cover specific updated methodologies better suited to the challenges of the emerging new era and suggest how to implement them using a new mission-oriented approach—the Joint Mission Framework (JMF). Developing JMF in some detail, we touch on how it might be used. We then use an Air Force example to suggest how key elements combine into an integrated approach with applications for strategic planning, experimentation, readiness, and training. Finally we propose that these new methods can improve not only long-term transformation efforts but also enhance operational military capabilities in the near-term.

2. Background

2.1 Establishing the Vision

JV 2010 establishes the conceptual template for how the US military “...will channel the vitality and innovation of our people and leverage technological opportunities to achieve new levels of effectiveness in joint warfighting.”¹ It sets a common direction for Services to develop their unique capabilities within a joint context. This is a new course towards a future of dramatic change. We must not only address implications of this change, but also understand and account for expected continuities in strategic and operational environments, such as: National goals and interests, missions, tasks and strategic concepts. To transform operational concepts into capabilities the template provided by *JV 2010* establishes six critical considerations: **D**octrine, **O**rganizational structure, **T**raining and education, **M**aterial, **L**eadership and **P**eople—DOTMLP.²

The *CFJO* expands visionary concepts and serves as a basis for all-out implementation. It provides better understanding of DOTMLP implications and an expanded perspective of C2 (command and control) as “...the single most important function in military operations.”³ This perspective stresses the importance of creating a climate of teamwork that engenders success. It defines the goal of implementation: to co-evolve (i.e., simultaneously develop) the DOTMLP that

¹ Joint Vision 2010, pg. 1.

² Joint Vision 2010, pg. 1-3, 33.

³ Concept for Future Joint Operations: Expanding Joint Vision 2010, May 1997, pg. 65.

will enable new operational concepts with fully realized capabilities while maintaining readiness at all points along the way. Meeting this challenge...

...require[s] innovative thinking and new ways to shape change if we are to retain our worldwide position of leadership as we respond to future challenges. A disciplined process for implementing *JV 2010*—centered on a holistic *CFJO*—can integrate and focus the joint and Service communities' efforts to develop the right...[DOTMLP]...for operations in 2010 and beyond.⁴

2.2 Constrained Implementation

The *Joint Implementation Master Plan (JIMP)* started out as a good, initial step for providing required integration and focus, but has fallen short in supplying necessary guidance, detail, discipline and holistic thinking. After nearly two years in coordination, it is still in draft. There are several reasons for this, but two are particularly important to our approach.

The most important concern involves creating a comprehensive set of desired operational capabilities. Although the notion of a set of future desired capabilities managed by various coordinating authorities gained some acceptance during *JIMP* coordination, the Services and other participants have not sufficiently narrowed and characterized them in terms most can agree with.

The next concern involves creating a suitable integration and comparative framework with which to effectively manage the transformation. The *JIMP* originally proposed using the Universal Joint Task List (UJTL) for this, but the Services strongly opposed this during coordination and the UJTL was never formally adopted. Even though most accept the need for an overarching, capability-based integration framework, they flatly rejected the idea that the UJTL could adequately fulfill that role in its current form. So, despite some good initial efforts and much dedication, there still is not enough discrete, actionable detail to effectively implement *JV 2010* across joint and Service communities in a comprehensive manner. We discuss the issues of this implementation in the following section.

⁴ Concept for Future Joint Operations: Expanding Joint Vision 2010, pg. 5.

2.3 Industry Initiatives

Like the military, the civil sector is contending with a global revolution that is fundamentally changing the makeup and operations of all organizations. The underlying cause of this revolution is a furious rate of change among many inter-related forces: worldwide information highways, global partnerships, downsizing, powerful microelectronics, cyberspace, and virtual operations. All of these are driving reinvention of management roles and major shifts in organization structures.

To meet their challenges, civilian experts are advocating holistic, integrated approaches to simultaneously evolve critical elements to meet their goals. They recognize the importance of enabling people to contribute value to an organization. An organization that constantly evolves, adapts to fast-changing demands and circumstances, and, most importantly, continuously learns at all levels. They also suggest that an intimate partnership between people and technology, particularly information technology, is a critical key to success.⁵

As windows of opportunity shorten, business dominance over others is increasingly more difficult to achieve. As the power of technology and the rate of change exponentially grow and accelerate, they see a widening differential between good organizations and backward ones that insist on clinging to old-world methods. To succeed in this new environment an organization must change and innovate faster than the competition—adaptability is key to surviving in this volatile arena.⁶

Despite all this good ‘visioning’ and parallel efforts in industry, there is increasing evidence that the US military still is not changing fast enough. In comparing military and civilian adaptation to change, one observes that the notion of “survival” is central to the civilian world, but perhaps less in the military. There is an argument that a “profit” motive may be more important to industry than it is in the military world. Therefore, while adapting the utility of “product” orientations in commercial practices may be appealing to military management processes and frameworks, the currently established culture may not allow ready adaptation of industrial practices. Nonetheless, we believe the principles of such adaptation are essential, and should be pursued even incrementally. We therefore will suggest approaches to such transformation in this work.

3. More Change is Needed

3.1 “Stovepiping”

The US Air Force Scientific Advisory Board (SAB) found that C2 support systems are reinvented every time a new operation is engaged, using Desert Storm and Bosnia as examples.

“While tailoring C2 to the unique requirements of an operation is a necessity, most of the effort is spent reengineering how the collection of C2 tools are connected and integrated, trying to achieve an acceptable degree of interoperability. Since

⁵ Martin, James, *The Great Transition: Using the Seven Disciplines of Enterprise Engineering to align People, Technology, and Strategy*, (New York NY: AMACOM, 1995), pg. i.

⁶ Martin, pg. 55, 293-5 & 301.

the resulting configuration and operational workarounds are unique, C2 training is inadequate. The result is an unacceptable long time to achieve an operational capability in theater and difficulty in sustaining an efficient C2 operation with trained personnel.”⁷

Further, the SAB found that

“...without an integrated C2 system, a limited capability exists to allow an assessment of the value a new capability will bring to an operation. Consequently, the Air Force finds itself with an almost infinite list of “could do’s” with limited means for determining what it “should do.” This decision-making paralysis at the requirements level, combined with funding and acquisition inefficiencies, makes the timely insertion and fielding of the new C2 capabilities the exception rather than the rule. Perhaps the most significant obstacle to supporting the JFACC with tailorable, interoperable C2 systems is rooted in an approach to equipping and provisioning for C2. Interoperability problems are often blamed on stovepiped acquisition. But stovepiping of C2 systems begins much earlier than acquisition or operations. Systems are stovepiped from the very beginning in terms of how they are defined, funded, advocated, and managed by the Air Force. This stovepiping problem extends to the very core of how forces are equipped.”⁸

3.2 Principal Needs

The SAB defines six principal needs that the corporate process must fulfill to successfully implement and, perhaps more importantly, sustain the C2 Vision (authors’ editorial comments are italicized after each one):

1. **Consolidate and integrate mission needs for conducting C2 in joint and coalition environment.** C2 needs cut across all MAJCOMs. The Air Force must integrate the common and unique C2 needs of each mission, establish and maintain an overarching C2 vision and investment strategy, and continually evolve the C2 requirements as new needs or opportunities present themselves, without getting caught up in a lengthy validation process. *This finding demands a framework that allows a distributed build of what these needs are across organizations and mission areas applied to actual operations, exercises, and day to day operations.*
2. **Focus the corporate PPBS structure on advocating and managing an integrated C2 program.** Financial planning must be integrated the same manner that the requirement process is integrated. This allows more effective investment decisions within the integrated C2 system and allows the Air Force Board structure to make decision about the

⁷ USAF Science Advisory Board, Command and Control for the 21st Century, Dec 96

⁸ USAF Science Advisory Board, Command and Control for the 21st Century, Dec 96

overall capabilities of the C2 system, rather than trying to decide to invest in a new planning tool vice and upgraded communications link. *There is, therefore, a need for a framework to allow directly connecting the investment strategy and decisions to actual operational tasks and objectives.*

3. **Develop a methodology and tools to determine the value of new capabilities.** The linchpin to making integrated and evolutionary requirements and funding processes work is to establish a methodology and tool set that determines the operational utility and cost effectiveness of new capabilities. *Here is more evidence of a need for a framework to allow weighing of investment options to the actual operational objectives and tasks.*
4. **Be able to rapidly select, mature, and field new C2 capabilities.** The process must expeditiously select concepts and capabilities which best meet mission needs, and rapidly mature, integrate, and field those new capabilities in a operational system. Changes to operational concepts, Training and Transfer Plans (TTPs) must be accomplished in parallel with the development, making an operational proving grounds and essential element of the process. *There is a need for a framework to explicitly link the investment options to the mission needs, TTPs and setting the fielding priorities.*
5. **Organize, train, equip, and provide for common C2 across the Air Force.** A common framework for C2 across the Air Force allows tailoring the C2 support system to the needs of the mission without developing new processes, systems, or training. Numbered Air Forces should have full time units dedicated to operation, support, and continual evolution of the C2 system. A major responsibility of these units will be to participate in the development of new C2 capabilities by conducting operational evaluations, CONOPs, procedures, and training development. *There is a need for a framework to allow the units to communicate with each other on what is important along with what each is pursuing.*
6. **Continually evaluate and evolve the C2 doctrine and operational concepts.** With the rapid advance of technology in this area, doctrine will, in general, lag behind the opportunities that new capabilities make possible. As the C2 system evolves, the Air Force must continually look for new opportunities by evaluating C2 doctrine and testing new concepts. *There is a need for a framework to allow effective development and communications of the new operational concepts*

directly linked to the actual objectives and tasks performed in actual operations.

3.3 Task Lists – The Current Framework

3.3.1 Increased Use and Influence

In the Department of Defense (DoD), vying for a share of the national budget is a fact of life for each Service. The UJTL is a family of task lists originally created by the Joint Staff and the Services to support joint training programs, and is an emerging element in this competition. While not doctrine, it affects how the joint community proposes to view training and operational capabilities, and, increasingly, how resources are allocated to support them. Besides expanding into areas like joint simulations and readiness reporting, many think the UJTL is a way to improve decision-making—including budget decisions—because it allows better comparison among competing service priorities. Consequently, Services are taking these lists more seriously, rethinking how they define themselves within the UJTL framework and implementing the lists in different ways. This makes the UJTL a potentially powerful change mechanism. However, as we will discuss, the UJTL in its current form has been rejected as not being up to the challenge.

Currently, the UJTL describes requirements for conducting, assessing, and evaluating joint and multinational training. It is a large, hierarchical listing of tasks performed by military forces at four levels of war: strategic national, strategic theater, operational, and tactical. It lists numerous *functions* under repetitive groupings such as, “employ forces” and “employ firepower,” throughout the hierarchy. Using the UJTL, commander-in-chiefs (CinCs) develop Joint Mission Essential Task Lists (JMETLs). That is, they enumerate those tasks deemed most important to accomplishing assigned missions (hence ‘mission essential task lists’). In this way, UJTL designers prescribe how operational capabilities are described: listings of ‘mission essential’ tasks associated with specified conditions and standards. So, even though the UJTL supports a basis for understanding military capabilities and defines them in a way that is aimed at assessment of joint training, there are many concerns that these lists do not present appropriate ways to portray military capabilities. Neither do they provide an ability to support dynamic transformation management, increasingly fast-paced operational tempos or other efforts adequately. Several examples reinforce these concerns.

For instance, Services were tasked to define the “bottom” or tactical portion of the UJTL under six task categories: deploy/conduct maneuver, develop intelligence, employ firepower, perform logistics and combat service support, exercise command and control, and protect the force. The other levels, those of strategic and operational, were apparently prosecuted by entities other than the components. Since the UJTL is organized around these levels of conflict (strategic to tactical), some observe that the services were being relegated to only those tasks associated with “battles and engagements.” Although this was probably not the intent, it does make it somewhat difficult for Services to represent their inherent strategic capabilities. To adjust for this, when Services developed their task lists they each took a different approach.

The Air Force Task List (AFTL), for example, is organized on the basis of self-defined “core competencies” instead of the six prescribed tactical-level tasks. AFTL authors readily admit to the deviation, but stress it is necessary to show how aerospace forces perform at all levels of war, not just at the tactical level. At the same time, this approach causes problems in ‘translating’ activities into relevant joint terms. For instance, “Provide lethal precision engagement” is only meaningful in the context of the objective the commander is trying to accomplish. Why not instead say “damage and destroy enemy armored formations”? Also, applying competencies to functions and missions that MAJCOMs, wings and other subordinate units must perform is not intuitive and additionally problematic. For instance, the finer details of precision engagement and global attack are difficult to measure, especially at a unit level, and the link between CinC and AFTL tasking is difficult to discern. Undoubtedly, other Services have had similar difficulties. Despite these drawbacks there is one big advantage with organizing according to competencies. It is oriented to output measures (e.g., air and space superiority) rather than inputs (“conduct maneuver,” “develop intelligence”).

3.3.2 Input Orientation and Mental Models

One of the biggest problems with the UJTL is that it has no *standardized* representation of similar joint missions among the CinCs. So, instead of focusing on mission, objective effects—i.e., output—UJTL and JMETL concepts orient people to think in terms of inputs, or ‘means’—not ‘ends.’ Without a common understanding of mission (i.e., operational context), people resort to various ‘mental models’ to conceptualize additional details. Sometimes this works well, other times it does not.

Forming ‘mental models’ is natural for humans. Like others, operational professionals intuitively draw on learned experiences and other sources, like operational plans, to provide understanding and insight about what to do and how to respond to various mission situations. Without a common framework of joint missions, they use various mental models to provide missing operational context and relate ‘standards’ and tasks in the JMETL process. This works when there is enough shared common understanding of operational context and conditions, which is normally the case in well-defined training/exercise events. However, determining measures and standards without a common basis results in lists and standards of questionable utility. For example, USACOM JMET ST 1.6, “Control or dominant strategically significant areas,” uses these measures:

- Days to achieve air superiority of key locations: 4 days.
- Percent of forces having operations delayed because key strategic terrain not under control of or able to use by friendly ground forces: 10%.
- Percent of forces having operations delayed for lack of full air superiority in key locations: 10%.

But what is the context? What is the operational impact of taking five days to achieve air superiority? What is the difference between delaying operations five or ten percent? Without common context and understanding many measures are meaningless. In fact, confusion and poor communication often results when people relate to the same situation while unknowingly using

diverse and/or counterintuitive ‘mental models.’ This is because most are not even conscious that they are using them. However, when certain courses of action run counter to ingrained thought patterns and perceptions, they are not usually adopted. Clinging to a Cold War conflict model in central Europe rather than understanding the nature of conflict in a multi-polar, post-Cold War era is a good example of this.

To effectively control, commanders must integrate and synchronize various individual cross-functional and cross-disciplinary ‘mental models’ within the same, specific joint context. Such common understanding and representation between echelons, functional components and disciplines across geographical areas, various scenarios and differing conditions is difficult, but critical. Without this, it is virtually impossible to precisely determine how forces are supposed to integrate necessary component capabilities for dynamic, flexible mission accomplishment. To illustrate, a CinC may be directed to “deter and defeat aggression by the forces of state X against neighboring U.S. allies” or to “destroy country Z’s war-making potential.” These broad missions must be translated through components (the CinC’s current employment mechanisms) and thence to units that prosecute joint missions with increasingly more specific objectives and tasks. A joint force air component commander (JFACC) would translate “destroy Country Z’s war-making potential” into an aerospace plan designed to achieve specific effects on elements of Country Z’s war-making potential. A fighter squadron commander would translate subsequent taskings into specific mission profiles tailored to achieve effects desired by higher command levels consistent with commander’s intent. And air and land component commanders must coordinate and synchronize forces and attacks against similar targets. This works best if all share a common ‘mental model’ that comprehensively relates capabilities, functions, and actions to missions, objectives and effects. Without a common framework for understanding mission tasking commander’s intent can be lost.

3.3.3 Other Shortcomings

To the extent one can intuit a scenario focus from the UJTL, it appears to reflect mainly the demands of a classic theater conflict, one associated primarily with large-scale ground operations. This omits important parts of the conflict spectrum and is incompatible with emerging concepts of theater war where highly mobile forces simultaneously strike an enemy’s strategic, operational and tactical military capability (centers of gravity) in parallel. It also makes evaluating service contributions to alternative conflict scenarios very difficult, if not impossible. Additionally, some tasks are not sufficiently specific while others are missing. For example: “conduct offensive counterair” can encompass destroying aircraft in shelters and conducting fighter sweeps over enemy-controlled territory; there is no mention of destroying and disrupting the enemy’s integrated air defense system under “air and space superiority.” On the other hand, there are far too many tasks, which causes many to be repetitive. For instance, what is the difference between “provide lethal precision engagement” and “provide strategic attack capabilities”? Between “perform lethal engagement functions” and “conduct physical attack”? Then again, some tasks may be superfluous. Why require guidance with an exhortation to “utilize a quality force” or to “manage flying resources”?

In sum, Title 10 charges each of the Services to provide capabilities required by the combatant commanders. Unless and until the Services can describe their peacetime and wartime activities in clear and compelling terms that relate to its Title 10 responsibilities, they will have a hard time justifying requests for resources. With an increasing need for an enduring framework to focus talents and energies on common objectives, the UJTL's reliance on intuitive understanding of capabilities and mission has too much variability to be effective.

4. Shaping Change in the New Era

4.1 *Implementing the Vision*

Continued widespread variability in understanding and interpretation of the vision only dilutes long-term focus on common objectives. Gone unchecked, this will perpetuate scattered, independent, uncoordinated efforts versus a comprehensive focus over the long haul. If this happens *JV 2010*, like many other visions, may degenerate into glittering generalities and never take effect materialize. Noted management consultant Tom Peters points out the importance of following the vision through with effective implementation, rather cynically, in *Thriving on Chaos*:

Sadly, "visioning" has become a fad. . . .The idea of an effective enterprise being energized and guided by a succinct and uplifting philosophy that dares everyone to take risks to realize its challenge is a compelling one—especially as an alternative to guidance . . .written for yesterday's placid conditions.⁹

To be truly effective an organization must live its vision. People, especially leaders, must culturally buy into it. In addition, the vision must be made accessible. This means directly translating it into discrete, tangible actions that do not require further clarification or guidance.¹⁰ Rapidly and continuously co-evolving DOTMLP to maintain readiness and achieving future 2010 capabilities in an era of increasingly accelerated change—the stated goal of *JV 2010* implementation—requires a significant change in culture, an important aspect of a fully integrated approach.

4.2 *Synchronized Disciplines*

Noted consultant and business leader, James Martin, advocates a fully integrated approach, called *Enterprise Engineering*. His is not a single methodology, but a sophisticated synthesis of the most important and successful of today's change methods, custom-integrated in the right combination, to fit an organization's specific situation and needs. It seeks to achieve a human-technical partnership of maximum efficiency where learning takes place at all levels. It is an important part of the total body of work referenced here. Still very much an art, a critical aspect of his approach involves fusing information technology—and its methodologies for creating computer systems an enterprise or organization needs—with proven business methods—and their methods for

⁹ Peters, Tom, *Thriving on Chaos* (New York NY: Harper Collins Publishers, 1987), pp. 485-6.

¹⁰ Peters, pp. 486-90.

transforming processes. The approach strives to energize all individuals, focus talents to a common purpose, draw out the very best in people and fully exploit information technologies.¹¹

4.2.1 Value Streams

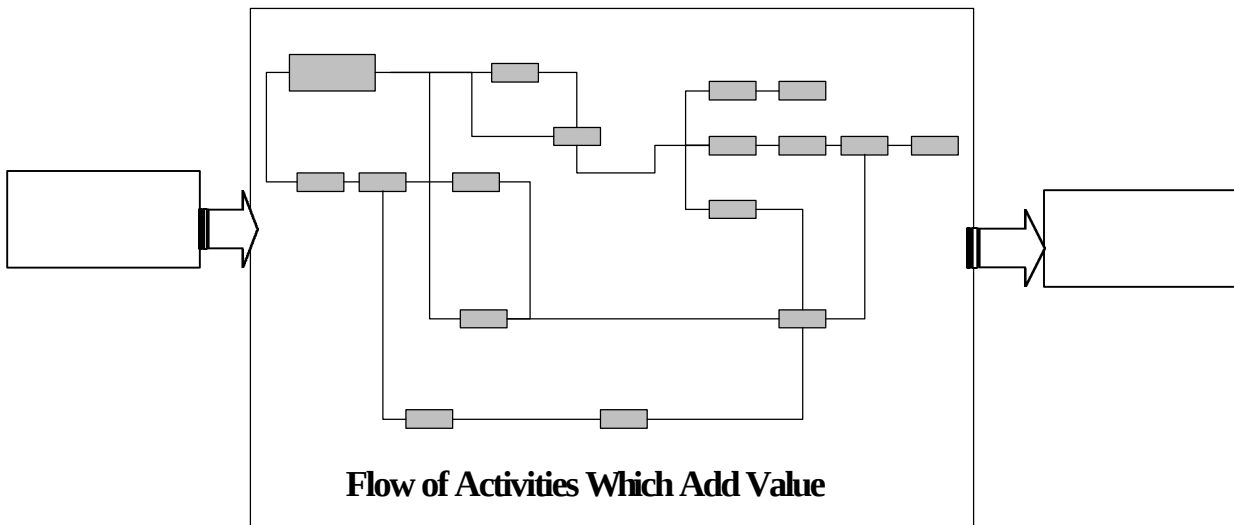


Figure 1. Value Stream¹²

One of the most important elements of this work for our purposes is the idea of thinking about processes and activities as ‘value streams.’ The Value Stream, illustrated at Figure 1, is more than just a process. It is a precisely defined concept for the end-to-end set of activities that delivers particular results for a given customer (internal or external). Some refer to the most important, or strategic, value streams as core competencies—those things that can be done significantly better than anyone else does them. They also advocate for expressing an organization’s strategic capabilities through a series of its most important value streams. By looking end-to-end across streams of activities and conducting “major surgery,” improvements achieved are often ten-fold, not ten percent. Consequently, reinvented value streams are powerful ways to focus on “breakthrough” jumps in effectiveness with tremendous results. For instance: Harley-Davidson reduced motorcycle frame manufacturing from 72 days to 2 and increased final product quality from 50 to 99 percent; many IT organizations changed to a RAD (rapid application development) process for application building to cut total development time from two years to four months.¹³

Aligning around value-stream teams is also very effective. Most core capabilities today meander across multiple departments and functional areas and influence only a small part of many people’s jobs rather than the explicit job of highly focused teams. When organizations do not focus closely on strategic competencies they fail to develop and exploit important capabilities, as they should. Clearly, value streams should be run by cross-functional teams and designed to achieve strategic

¹¹ Martin, pp. 58, 59-61 & 80.

¹² Martin, pp. 105.

¹³ Martin, pg. 63-69.

goals as directly as possible, using technology when possible to maximize effectiveness. Because they are often more alert to changing needs than top management and are more aware of possible desirable innovations, value stream teams should also be involved in strategic processes.

4.2.2 Strategic Visioning

Another important element that relates to how top management formulates vision and strategy for the enterprise or organization and determines where it is going is strategic visioning. This is important for implementing an effective process to change from what we are doing today towards an assured means to provide the needed capability to reach ultimate objectives.

I skate to where I think the puck will be. *Wayne Gretzky*

This statement implies how important strategic thinking and acting are – even more important than planning itself. Wayne Gretzky does not use an involved strategic plan. What he does, instead, is to think strategically (and implement tactically) throughout the game, in keeping with a typically simple game plan worked out in advance.

If one thinks about what one must know and be able to do in order to make such a comment and deliver on its substance, one obviously would need to know the purpose and rules of the game, the strengths and weaknesses of one's own team, the opportunities and threats posed by the other team, the game plan, the arena, the officials, and so on. One would also need to be a well-equipped, well-coordinated, strong, and an able hockey player. The process is all about identifying the Strategic Issues, developing the strategy to address them, and making an action plan to implement these.¹⁴

According to John M. Bryson, noted professor of planning and public affairs at the University of Minnesota and author of *“Strategic Planning for Public and Nonprofit Organizations: A guide to Strengthening and Sustaining Organizational Achievement,”* the generic or basic Strategy Change Cycle is as follows:¹⁵

1. Setting the organization's direction
2. Formulating broad policies
3. Making internal and external assessments
4. Paying attention to the needs of key stakeholders

¹⁴ Bryson, John M. *Strategic Planning for Public and Nonprofit Organizations – A Guide to Strengthening and Sustaining Organizational Achievement* 1995

¹⁵ Bryson, pg. 21.

5. Identifying key issues
6. Developing strategies to deal with each issue
7. Planning review and adoption procedures
8. Implementing planning
9. Making fundamental decisions
10. Taking Action
11. Continually monitoring and assessing the results

4.3 Role of Experimentation

Although experimentation can be applied in a variety of ways, its fundamental role is to promote widespread learning. To prosper in the 21st century an organization must be “...skilled at acquiring, creating, storing, and transferring knowledge, and using it to change the way work is done.”¹⁶ Accelerated learning creates a significant edge over competitors. Large-scale operational military experimentation can help create, accumulate and integrate such knowledge. Likewise, knowledge infrastructure development and value streaming can help form the foundation of an effective experimentation effort.¹⁷

The principle result of increased insight and learning is to stimulate cultural and organizational development that, in turn, helps overcome barriers to change. The Air Force’s large-scale effort, Expeditionary Force Experiment ’98 (EFX 98), was an excellent example of how people can come together and be encouraged to take risks and innovate. It used teams of talented individuals, formed along cross-disciplinary, cross-functional value stream lines to stimulate discussion and learning through collective experience and airing of differing points of views. Unlike many other forums, participants had a lot of freedom to act on their beliefs and leverage new learning from others. Real leverage came from schedule-driven events that forced people to overcome issues of “not-invented-here” and cooperate to apply what had been learned. Additionally, a lot of effort went into creating a controlled environment and building an

¹⁶ Martin, pp. 407.

¹⁷ Martin, pp. 432-433.

information-enabled infrastructure to support all elements of the event, with particular emphasis on documentation and dissemination of lessons learned.

All this paid off. It introduced many stakeholders to innovation: customers, affected personnel, IT staff, and suppliers, other Services and a multitude of other 'partners.' Besides helping to validate parts of new value streams that affected them, it provided better risk management and allowed participants to experience enthusiasm and excitement, first-hand, giving stakeholders a feeling of "ownership" in the new process because they contributed ideas and effort to it. For instance, many entered with a mental model against distributing operational functions between forward and rear command centers. In the end, most, including some very senior and respected skeptics, were convinced of its merit. The Army and US Marines report similar findings in their experiments.

For maximum benefit, experimentation must be guided by a vision of where it is going. Innovation should not be random, but targeted at certain customers, goals, core competencies, or strategic value streams.¹⁸ In this regard, a new Air Force strategy change process, covered in detail later, seeks to thoroughly integrate experimentation and other important concepts.

5. Developing the Key Element—Joint Mission Framework

All the above lays out a foundation for applying advanced management concepts to help realize *JV 2010*. But without an overarching framework to link actions across organizational boundaries this remains a difficult task. *CFJO* states that the conceptual expansion of *JV 2010* should cause us to question some relationships and derive new or better models that describe future joint operations.¹⁹ To overcome these difficulties we propose leveraging existing UJTL efforts and by making significant adjustments to overcome its shortcomings.

5.1 Required Characteristics

First step is having a clear concept of the new framework's purpose. Enumerating and classifying the products of organizations—i.e., the capabilities units provide—properly focuses inputs (people, resources, and activities) on outputs. Of course, Services *per se* do not fight wars; combatant commands do that. Services are responsible for providing ready forces to execute the missions assigned to combatant commands. This suggests that the framework must encompass all operational and support tasks that force elements might have to accomplish in “real-world” operations. Further, by focusing on operational effects, or products, contributions to operational capabilities can be more effectively measured. Finally, this framework must provide a basis for better operational assessment and comparative analysis that Services can use to accomplish their objectives. To do this a framework must have the following characteristics:

- **Functional tasks should be derived from and relate directly to joint missions.** Joint missions—those assigned to combatant commanders—are the lodestar of DoD. Either directly or indirectly, they guide all activities. Thus, their demands are properly the centerpiece of joint planning. Describing and explaining service activities and resource needs in these terms is the approach most likely to yield positive results.
- **The Framework needs a comprehensive, but flexible, list of functional tasks.** It should encompass all major activities an institution must undertake in order to provide capabilities needed by the nation. However, they should not overspecify or describe how tasks are accomplished. What is desired is a concept that is adaptable to the entire range of military operations, not just one rigid model having a static (and possibly fragile) foundation.
- **The Framework needs to be adaptable to needs of different units at different levels.** Different operating levels must be able to tailor functional task lists by readily identifying and choosing those tasks that apply to their primary and secondary areas of responsibility.
- **Lists of functional tasks need to be of a manageable size.** They must be framed at a level of detail that yields a manageable number of entries organized in a logical fashion.

¹⁸ Martin, pp. 433-434.

¹⁹ Concept for Future Joint Operations: Expanding Joint Vision 2010, pg. 2.

With these characteristics, a new model and framework can comprehensively relate more complete operational context and reduce reliance on various ‘mental models.’ It can accurately depict military ability to accomplish missions and objectives across the spectrum of conflict demanded by the nation, and, specifically, combatant commanders-in-chief (CinCs), in innovative ways that incorporate needed improvements above.²⁰

5.2 Output Oriented Design

We have argued that the UJTL should directly focus on missions for which military forces are established. Here we propose a framework that is focused by this operational context that offers many significant advantages. It is based on enduring continuities, outlined earlier from *JV 2010*—specifically joint missions (i.e., an output, or ‘ends’—not ‘means’—orientation).²¹

The following are broad missions like U.S. combatant commanders would likely be assigned.²²

- Strengthen stability and deter aggression in key regions through operations and interactions in peacetime.
- Resolve crises: provide humanitarian relief, enforce peace agreements, protect/evacuate civilians, rescue hostages, conduct punitive strikes, and intervene against hostile regimes.
- Win “cold wars.” (Addresses the military dimensions of a long-term political, economic, and military strategy aimed at isolating and exerting pressure upon an adversary state).
- Counter weapons of mass destruction: impede proliferation of NBC weapons and their delivery vehicles, deter/prevent their employment through use of counterforce attacks and active/passive defenses.
- Defeat large-scale aggression and compel surrender.

Each of these missions can be divided into specific components. For example, the broad mission of defeating large-scale aggression contains the elements of an overall theater campaign that would have two major phases, as shown in Figure 2.

GAIN CONTROL	COMPEL SURRENDER
Dominate air operations Dominate maritime operations Halt the invasion Deter/prevent WMD use	Degrade/destroy war-making infrastructure Isolate, demoralize, destroy fielded forces Evict enemy forces from captured territory Seize and hold ground

Figure 2. Campaign Objectives in Theater Warfare

²⁰ This approach is detailed in Willard Naslund and David Ochmanek, *Organize, Train, and Equip for What? Towards More Useful Joint and Service Task Lists*, DRR-1901-AF, RAND, August 1998.

²¹ The joint mission framework sketched here is drawn from concepts developed by Glenn A. Kent and David A. Ochmanek and described in their report *Defining the Role of Airpower in Joint Missions*, MR-927-AF, RAND, Santa Monica, CA, 1998. See Attachments A and B for draft frameworks of major theater war and peacemaking/peacekeeping.

²² A similar list of broad missions of the U.S. armed forces can be found in the *Annual Report of the Secretary of Defense*.

A strategy for accomplishing campaign objectives is built on detailed operational tasks and functions. To illustrate, the objective “halt the invasion” might comprise three operational tasks: (1) delay/destroy/disrupt lead units of invading armies, (2) provide fire support to friendly forces in close contact with enemy ground forces, and (3) delay/damage enemy forces and logistics support in the rear.

These in turn would stimulate subtasks such as destroy armor on the attack, disrupt key attack routes, etc. Flowing from the subtasks would be the *functions* necessary to accomplish them. This is the place for applying specific military capabilities expressed in terms of types of forces, their employment, and related support elements. Task lists should have the features defined above, and they should also provide a menu of tasks for use by headquarters staffs down to units.

We believe that task lists derived from joint missions could become the basis for evaluating and reporting service readiness in operational rather than resource terms. These should delineate the operational tasks that different types of units perform. For example, either in the service lists or in lists prepared by subordinate echelons, distinctions should be made among different precision-guided munitions being delivered by different platforms using different tactics against different categories of targets, 24-hour surveillance provided over different areas, ground defense for airbases of different types, or bedding down forces of different sizes and types within different time periods. This method of determining unit functions could (and we believe should) lead to the assessment and reporting of the ability of individual units to accomplish the tasks, either immediately or with lead-time. Likewise, higher command levels could assess the changing preparedness of collections of units for meeting CinCs’ requirements during planned or potential peacekeeping operations, small-scale conflicts, major theater wars, or even global conflicts.

Using an Air Force example, it would be more compelling to state that the Air Force could put forces and resources into a CinC’s theater and fly a given numbers of sorties of given types within a specified number of days than to report that certain percentages of its units were rated C-1 or C-2 under SORTS (Status of Resources and Training System). Readiness could be measured in terms of outputs—i.e., what the Air Force is capable of doing—rather than in terms of inputs. Planning, Programming and Budgeting System (PPBS) justifications for specific resources and training could also be greatly strengthened if shortfalls were linked systematically through the task lists to specific joint missions, thereby highlighting any reduced capabilities.

Finally, from the very practical perspective of wings and squadrons, task lists tied to joint missions would link easily and directly with existing mission capability statements and with units’ associated Designed Operational Capability (DOC) statements that imply specific training needs. At the same time, units at all levels could enhance the relevance and value of readiness inspections and other evaluations by concentrating on tasks that link clearly to CinC missions.

5.3 Representing Operational Context

The concept of organizing, training, and equipping forces to meet the operational objectives of combatant commanders is manifested in the joint mission framework defined above. We have suggested that experimentation and assessment of the capabilities built in this operational context will need to be assessed, and experimentation will need to be conducted to provide a basis for

improvements and adaptation to change. To do this requires applying the operational context of the Joint Mission Framework to a mechanism that can provide this assessment: to a descriptive *process* model. Combining these two components, operational and process, should provide an enduring mechanism for applying task lists to assessment of military capabilities supporting national objectives and operational commanders. Figure 3 shows the operational context.

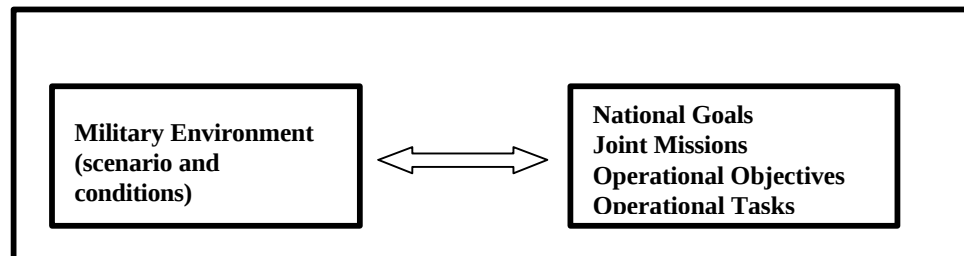


Figure 3. Joint Mission Framework: The Operational Context

There will be a very large range of scenarios ranging across the spectrum of conflict from major theater war to smaller scale military operations.²³ We offer a notional set of two JMFs, one for major conflict and another for peacekeeping/peacemaking at appendices A and B.

5.4 Representing Functional Processes

We move now to the processes and functions that can describe the application of the joint mission approach and its assessment. Figure 4 depicts this process/functional model.

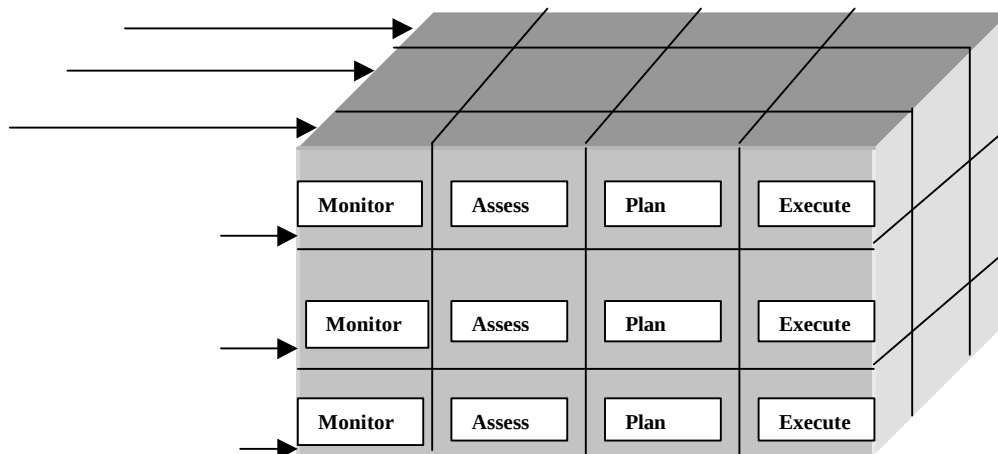


Figure 4. Joint Mission Process/Function Model

The first dimension of the model portrays the hierarchy of application: campaign, force application, and engagement levels. These are not directly related to the strategic-operational-tactical levels found in the UJTL. The reason for this is the confusion that these paradigms have caused in locating the functions done by components (like the Air Force defining its functions in

²³ Somehow, the term military operations other than war doesn't capture such a spectrum.

terms of core competencies). This logic is seen better when the second dimension, the processes, is related.

Monitor, assess, plan, and execute are the ‘high level’ process functions that occur across all military operations, across all levels. Further, one notes that the ‘execute’ function is not separated from the others. This permits the framework to depict any number of value streams in a standardized ‘sensor-to-decision maker-to-shooter’ manner. This relates how an F-16 delivering munitions and a battery firing ATACMs are both operational extensions of C2 processes that got these weapons systems pointed. Results of their weapon deliveries will reenter the process where assessments are made. At the engagement level, the F-16 reports his battle damage assessment (BDA). At the force application level, the ISR and various targeting agencies assess the mission effects on a particular operational task, such as closing an LOC. At the campaign level, the strategy division of an air operations center, for instance, advises its commander that the operational objective of halting an enemy has been enhanced by the combination of LOC attacks, strikes against lead echelons of the enemy force, and by attacks on enemy support elements in rear areas.

This example intuitively portrays how the combat elements of military operations relate across process and functions, but there is (in this concept) another dimension. Behind combat functions are those of their support. We choose to use Army terms for these; combat support and combat service support. Combat support is that set of functions and organizations that directly supports combat operations. In the Air Force, these would be air refueling, airborne warning and control, airlift, etc. Service support would be those that support both combat and combat support, such as: supply, administrative functions, civil engineering, etc. Each of these support activities would relate across the campaign, force application, and engagement levels, and with the corresponding monitor, assess, plan, and execute functions.

5.5 *Linking Means to Ends*

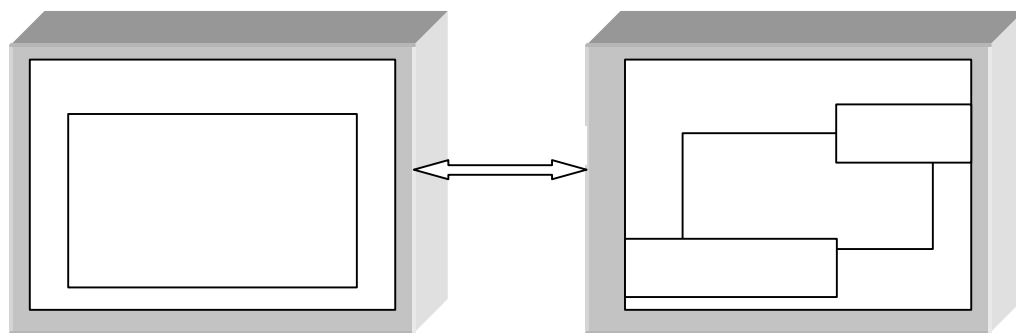


Figure 5. Integration of Joint Mission Framework and the Process/Function Model

By itself, the process/function model cannot provide the operational context that drives it. (This comes from the joint mission framework depicted in figure 3.) Each element of the process/function model is related across the framework to build the picture of activities occurring within them. We show this relationship in Figure 5. We further link the operational context to

processes and functions by keeping their relationships in mind. The operational context is the “ends,” the process/functions are the “means” to these ends.

We have described examples above of how operational objectives and tasks are related at each level to the functions and processes. But one other element needs to be added. This is the concept of operations that are required at all levels of the model and framework: the “how” of the tasks. Each operational objective and task is manifested in a concept of operations (CONOPs). An F-16 delivering munitions on an LOC is a product of all of these components. Its employment functions are the end point of a series of CONOPs that monitored enemy force activities, assessed its importance to the Joint Force Commander’s priorities, and planned a force package that allowed the effect to be obtained. Again, this component of the processes and functions repeats at the three operational levels, is supported by combat, combat service, and service support components, is driven by the operational context of the joint mission framework, and shaped and defined by CONOPs at all levels. And this process is one closely matching the concepts of value streams mentioned earlier.

5.6 Improved Comparative Basis and Analyses

The framework and model described above can be applied to assessments of military capabilities to respond to the needs of CinCs and National Command Authorities. It is entirely objectives and effects-based, so that assessments can be based on products and outcomes, rather than isolated functions and inputs. One can define the quality of systems to stop an armored invasion better than defining how well a system delivers a certain kind of ordnance; operational measures derived from the joint framework and process/function concepts demonstrate true utility and effectiveness, not just compartmented effectiveness.

Metrics and performance standards can be developed that correspond to each portion of the process model described above. For example, a combat activity at the engagement level performing engagement functions (the lower right hand block of the process/function model) would define its capability in terms of how well it performed specified operational tasks. For example:

- An F-16 unit delivering ordnance to attack a bridge (a function),
- which would close an LOC (an operational task),
- would contribute to operational objective of halting an armored force.

Metrics here could be those related to:

- responsiveness (getting there at the right time and finding the target),
- munitions delivery precision (was the target hit?), and
- effects (was the target destroyed, was the LOC closed, was the armored force halted?).

Behind this block in the process model would be the ones labeled Combat Support and Service Support. Functions, and units, would be those (for example) directly supporting the F-16 described above, such as the munitions unit preparing the ordnance for the F-16, flight line

functions delivering an in-service aircraft, the messing facility that fed the aircrew, etc. These as well could have similar, appropriate metrics assigned. These can be metrics with utility, telling a story that can be useful because they relate effects; they are objective-based. The function, in this case the unit being looked at, has a proper, more comprehensive measure of its capabilities to report.

6. Integrated Applications

6.1 Air Force Case Example

6.1.1 Strategic Planning Process—“How It All Fits Together”

The Aerospace Command and Control & Intelligence, Surveillance, and Reconnaissance Center (AC2ISRC) is the lead organization to integrate and influence Air Force C2 and ISR. Charter responsibilities include modernization planning, C2 & ISR operational requirements, configuration control, and experimentation. Its primary task is to ensure AF C2 & ISR meets the challenges of Global Engagement and JV 2010 and beyond.

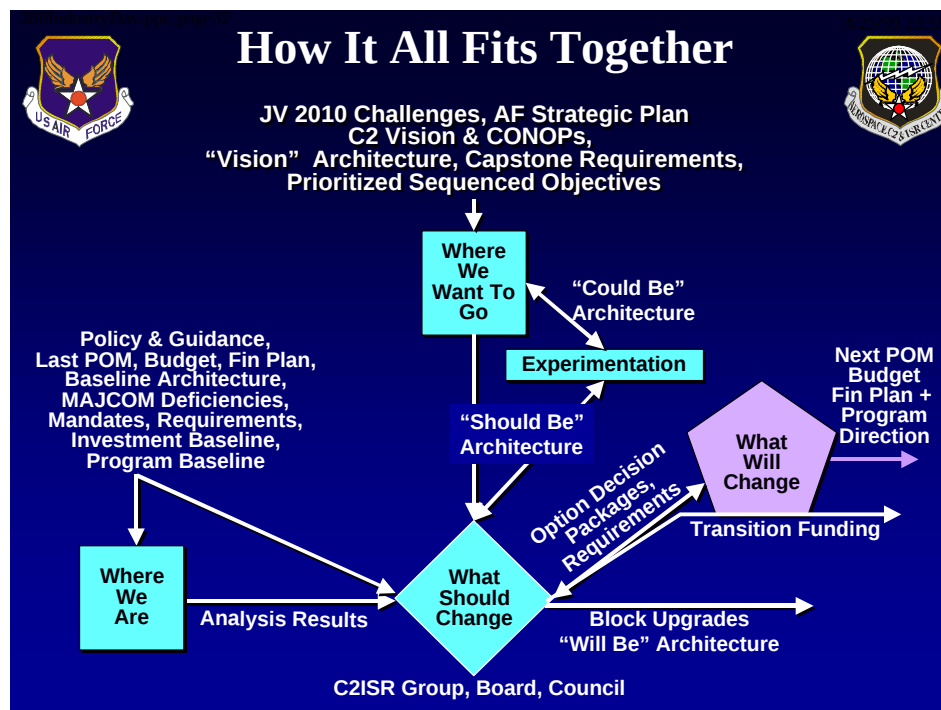


Figure 6. AC2ISRC Strategy Change Process

Using the work of Professor John M. Bryson, cited earlier, the center designed a strategy change process, “How It All Fits Together” (Figure 6), that aligns with other change concepts already mentioned. This process extends current deficiency-based planning concepts to create a new, integrated approach that is as much a strategic management process, as it is anything else. It combines a capability-based framework with the *JIMP*, Air Force Strategic Plan, Mission Area Planning instructions and other inputs, to create a straightforward process of four guiding statements: Where are we, where do we want to go, what should change, and what will change.

We compare where we want to go with where we are, use the results of experimentation, consider critical deficiencies and, then, determine what should change through a structured decision process. This results in the investment strategy being presented in option decision packages as the input for the C2 POM, Budget and Financial Plan (Fin Plan) along with the top level definition of the Block Upgrades. All this is the “Will Be” Architecture.

Where We Are – The output of this step is an understanding on what we are spending by Investment Category - the dollars break out - along with what capabilities are already being planned based on the current POM, Budget and Fin Plan - the Program Baseline. The Baseline Architecture is a top-level description utilizing the C4ISR Architecture Framework products of what is in the field today up to the start of the next POM cycle. What are the C2 Centers? What are they expected to be able to do? What systems do they use? What is the state of the Global Grid to connect them? Then we analyze this architecture; e.g., look at reengineering aerospace control elements, determine the system architecture and various software applications needed for the future, determine how we could merge and/or consolidate centers, how can we reduce the forward deployed footprint etc.

Where We Want to Go – The prioritized sequenced objectives make up the roadmap of what capabilities are needed to realize the C2 portion of the vision. These objectives are determined through analysis of vision-related documents such as *JV 2010*, Global Engagement and the AF Strategic Plan. The formal requirements are documented within the Capstone Requirements Document. The “Vision” Architecture is a top-level description of this vision.

Experimentation – We must experiment with some of the concepts represented in the vision to determine the “Should Be” Architecture. The Air Force Experimentation Office is responsible for developing the “Campaign Plan for AF Experimentation”. This document lays out the five-year experimentation focus. We will show more specifics shortly, but note that experimentation is fully integrated into AC2ISRC’s overarching strategic planning and programming process.

What Should Change – The available information comes together with the MAJCOM Critical Deficiencies and the C2 Board process determines what should change. Several analysis models are used. The information along with the decision history is packaged as Option Decision Packages - HTML linking all needed information. Along with the input to the financial realm, this decision process also includes the definition of the C2 Block Upgrades - what capability will be added year by year. A significant input to this is managing the technology transition funding which requires Pentagon notification but not approval. With the approved POM, Budget and Fin Plan along with the Block Upgrades we have the “Will Be” Architecture.

What Will Change -- Everything discussed so far is an outside the “building” (Headquarters Air Force) process. The Air Force Corporate Process takes the input from the C2 Board Process and is responsible to determine what will change.

This integrated approach addresses a problem with strategy formulation today as they perceived it. That is, directly focusing on changing the funding line of a program(s) through submitting initiatives and/or disconnects during the POM process—a deficiency-based approach. Plus, they do not confine themselves to only material solutions, but instead, strive to co-evolve all DOTMLP elements as *JV 2010* recommends. However, without an approved list of joint future capabilities, as mentioned earlier, AC2ISRC coordinated one its own across the Air Force to develop their framework.

The AC2ISRC developed the Aerospace C2 Capabilities Framework, made up of 13 capability categories (e.g., Joint Aerospace Applications, Base/Unit Level Communications, Information Interoperability, Global Communications, Modeling and Simulation, Education and Training, etc.). This framework is the “backbone” of the Strategic Planning Process especially for categorizing the End States, Objectives (with Performance Targets), Technology Assessment and categorization, EFX Initiative categorization, MAJCOM assessment of current capability, Investment Strategy, Roadmap, and lastly POM integration and submission. This framework is what links many separate efforts—specifically, it is used to link investments across Program Elements. Central to the entire C2 modernization process is an agreed upon description of what Aerospace C2 does (value to missions) and the capabilities which enable accomplishing the Vision. Currently there are several models that describe a portion of these capabilities. The C2 Capabilities Framework synthesizes these efforts and could be significantly enhanced by the natural complement of the Joint Mission Framework, as proposed next.

6.1.2 Operational Experimentation

As noted before, experimentation is an integral part of the AC2ISRC strategic change process and is applying these concepts and elements to the full range of military experimentation. Indeed, the framework and process model is being used to assess the Air Force’s large-scale operational experimentation effort—Joint Expeditionary Force Experiment (JEFX) series. It will be an experiment itself within JEFX 99, and will be expanded to help shape the structure of JEFX 2000.

Assessment (and experimentation) of military capabilities is based on several things: experience in combat, extension of this experience into future developments, and a lot of modeling and simulation. The difficulties with current M&S quality are well known, but they are the principal means available for the components of DoD to judge capabilities. This is all the more reason to develop a framework for assessment that is focused on the capabilities demanded by the CinCs and their masters, and which shape and drive measures that will allow their objective assessment.

With assessment a specific EFX 98 focus area, AC2ISRC put forth concerted effort to develop a vastly improved, IT-enabled infrastructure to collect lessons learned and ensure widespread sharing of accumulated knowledge. Aligning around several value streams with standing teams, mentioned earlier, substantially increased cross-functional and inter-disciplinary *communication*

and greatly facilitated the process. Many were surprised by how fast operationally savvy team members readily embraced the intuitive sensor-to-decision maker-to-shooter value stream construct. This also helped mature and refine early JMF construct concepts. In the end, the effort achieved remarkable results.

The number of lessons learned submitted increased ten-fold from that of a comparable Air Force exercise. By pre-associating people—and, thus, their lessons learned—to specific functions, organizations and operational outputs (i.e., mission effects or ‘ends’—the operational context), people more rapidly synthesized data and information into knowledge. This accounts for how those previously mentioned ‘mental model’ cultural barriers involving split-command center operations broke down so quickly. In fact, two of the three numbered air forces are fully embracing the concept and plan on exercising distributed command center operations immediately. Plus, EFX efforts uncovered, and ultimately resolved, a major issue involving incompatible communication ‘fire walls.’ This reduced costs because it was discovered earlier in the development cycle. There is more, but, bottom line: large-scale experimentation is a powerful force for co-evolving DOTMLP.

This is how AC2ISRC is implementing their part of Vision today. So far, it has proved very effective in breaking down counterintuitive mental models and providing a common basis of understanding. Use of future desired capabilities-based framework to complement traditional deficiency-based approaches appears to be a sure winner. It has achieved remarkable results in cutting across organizational ‘stovepipes’ and overcoming barriers to change. At the same time, a Joint Mission Framework would further enhance their effort; with it, they could:

- more clearly articulate the objectives to reach the vision by adding specific measures of performance using the JMF objectives and tasks
- more clearly articulate the deficiencies of current operations
- better communicate the baseline investment – the JMF tasks could be used to articulate which ones are being upgraded
- more accurately document the operational architecture by describing what C2 Centers perform by utilizing the Joint Mission/Function Process Model
- better define requirements – especially for mission applications (software) by using the JMF objectives and tasks as the foundation for the requirement statements
- articulate integrated block upgrades by referencing capability statements aligned with the JMF objectives and tasks

AC2ISRC is using these concepts to promote better assessment of joint experimentation and shape the capabilities of future military force structure. But, more than long-term applications, overall effects would be further enhanced if near-term readiness and training programs and reporting were compatible with the JMF.

6.2 Readiness and Training

Recalling this paper's early *Background* section: besides ensuring future capabilities, another goal of visionary implementation is to balance DOTMLP all along the way to maintain near-term readiness. This is the "Where We Are" portion of the AC2ISRC's strategy change process. However, during readiness discussions, this question usually arises: "Readiness for what?" If a framework similar to the one described above is good enough to respond to the demands of the CinCs, it should be good enough for the services to use as they organize, train, and equip service forces to meet these demands. Further, one can speculate that there would be changes in many responsibilities. The question above would then be answered as: "readiness to meet operational objectives and tasks."

Service organizations would be affected, because they would be oriented to structures responsive to operational objectives and attendant products. A command center, for example, would be flexible and adaptive, because it would need to be able to command and control a full range of military operations, not just a major theater conflict. There might be a command center deployment package for humanitarian operations that was primarily an airlift center with a defensive component and a State Department activity, for example. A peacekeeping operation would need a lot of ground force liaison, extensive communications infrastructure tied into local systems and political functions, and rapid intra-theater mobility means.

Training would be responsive to the functions and tasks defined above rather than the classic missions held by each service. How, for example, is interdiction different than halting an invading Army? One aspect is in the need for large force packaging and the need to train for complex flying operations rather than one where practice with a flight of two aircraft at a local range assumes that this would provide proficiency in interdiction. The example of differing scenarios discussed above also defines environments for changing the components of training. These are surely not marginal changes; they are potentially very large ones.

Finally, the service (and DoD) function of equipping forces would have quite different sets of concepts about how each Service could perform this responsibility if this joint mission and process concept were adopted. Reasons for developing and procuring equipment would be significantly affected because the basis for these activities would be whether the decisions involved would improve capabilities to meet CINC demands, rather than the historically reserved service roles. If a Navy cruiser, (compared to an Air Force unit, for example) could deliver quicker, more precise and destructive firepower on a specified target that would allow a CinC to meet their objectives, this could provide a strong argument for supporting Navy cruisers over an Air Force capability. Or if (as seems the present case) Navy sea-launched missiles are responsive to current scenarios (Iraq and Yugoslavia), where risk to air and ground forces is a factor in National decision-making, and the national objectives are to achieve results at the lowest risk to our soldiers and airmen, then arguments for more sea-launched missiles are readily made. The reason for this is simple: if a service has developed a capability to satisfy the demands of a CinC to accomplish his operational tasks, and if that capability is focused directly on that CinC's operational need rather than a particular service traditionally owned role, a decision about which capability the CinC and DoD will support should be a simple one.

So, besides incorporating all other advantages of an integrated approach, this further bolsters our argument regarding the JMF's superiority over the current UJTL for purposes of expressing military capability, whether in the far-, or near-term.

7. Conclusion

We have argued that the US military must embrace new ways of shaping change in the emerging new era or it will fail to effectively advance military capabilities and attain the goals of *JV 2010*. We have argued that civilian management experts face many of the same challenges, and, so, we should adapt and apply their most successful techniques to achieve our goals. We have argued that task lists are necessary instruments to describe military capabilities, but that they should be proper ones. We have also argued that the current series of task instruments based on the UJTL are flawed, since they cannot connect the needs of the military commanders (the NCA and the CinCs) to the capabilities they want. Many of our current structures instead do not allow for a flexible, truly joint basis for responding to these needs.

We propose that applying updated methods through a framework based on joint missions, the operational objectives and tasks that a CinC defines, is a more suitable approach for satisfying demands of an emerging new era. The joint mission framework is an objectives-based structure that is founded on these CinC operational objectives and commensurate tasks. We also propose that this framework provides the context for what we call the process/function model. It can be used to define how military forces perform their functions in response to the taskings of the joint mission framework in an operationally intuitive manner involving any number of sensor-to-decision maker-to-shooter value streams. The model is comprised of four processes (monitor, assess, plan, and execute), three levels (campaign, force application, and engagement), and three levels of support (combat, combat support, and service support). In concert with the Joint Mission Framework, the model can be used for capability assessment, and can also be used to shape joint experimentation (its structure is currently being used by the Air Force Experimentation series).

Finally, we suggest that this combination of enhanced methods, framework and model have some significant potential for applications beyond experimentation and assessment. They can be used in future decision environments for force structure, and for assisting the service functions of organizing, training, and equipping forces for the combatant commands.

Appendix A

Joint Mission Framework

Major Theater Conflict

J.1 JOINT MISSION: Deny the enemy the ability to operate ground forces

Operational Objectives

Operational Tasks

- J.1.1 Halt invading armies
 - J.1.1.1 Delay/destroy/disrupt lead units of invading armies
 - J.1.1.2 Destroy/disrupt enemy ground forces in close contact with friendly ground forces
 - J.1.1.3 Delay/damage enemy forces and logistics support in the rear
- J.1.2 Destroy/demoralize, and render ineffective armies in the field
 - J.1.2.1 Delay/damage enemy forces and logistics support in the rear
 - J.1.2.2 Disrupt/destroy enemy forces day and night
 - J.1.2.3 Degrade enemy command and control of ground forces
- J.1.3 Evict armies from designated areas, occupy terrain as necessary
 - J.1.3.1 Eliminate enemy defensive positions
 - J.1.3.2 Gain entry into a region
 - J.1.3.3 Deny fire support to enemy defenders
 - J.1.3.4 Degrade enemy command and control of ground forces
 - J.1.3.5 Establish control over enemy forces after surrender

J.2 JOINT MISSION: Deny the enemy the ability to operate naval forces and maritime assets

Operational Objective

Operational Tasks

- J.2.1 Interdict and control naval combatants and maritime traffic
 - J.2.1.1 Destroy/disable surface ships at sea or in port
 - J.2.1.2 Degrade/confuse shipborne sensors
 - J.2.1.3 Disrupt choke points and anchorages
 - J.2.1.4 Sink/disable surfaced submarines
 - J.2.1.5 Degrade/confuse submarine sensors
- J.2.2 Destroy or deny the use of naval support facilities
 - J.2.2.1 Destroy naval command bunkers
 - J.2.2.2 Destroy shipborne command posts
 - J.2.2.3 Disrupt communications and maritime navigation systems
 - J.2.2.4 Destroy ports, logistics facilities, and anchorages

J.3 JOINT MISSION: Deny the enemy the ability to operate aerospace forces and other air defense forces

Operational Objectives

Operational Tasks

- J.3.1 Defeat enemy air attacks
 - J.3.1.1 Destroy aircraft in flight
 - J.3.1.2 Destroy cruise missiles in flight
 - J.3.1.3 Disrupt sensors on enemy aircraft and weapons
- J.3.2 Suppress enemy surface-based defenses
 - J.3.2.1 Destroy fixed SAM launchers
 - J.3.2.2 Destroy mobile SAM launchers and anti-aircraft guns
 - J.3.2.3 Destroy tracking and engagement radars
- J.3.3 Suppress enemy space-based defenses and offensive capabilities
 - J.3.3.1 Destroy/disable ground-based space associated facilities
 - J.3.3.2 Destroy/disable space-based space associated facilities
- J.3.4 Suppress generation of enemy air sorties
 - J.3.4.1 Destroy/damage runways and taxiways
 - J.3.4.2 Destroy aircraft in the open or in revetments
 - J.3.4.3 Destroy key hardened support facilities
 - J.3.4.4 Destroy aircraft in hardened shelters
- J.3.5 Degrade enemy command and control of air forces and integrated air defense
 - J.3.5.1 Destroy command bunkers and other critical nodes
 - J.3.5.2 Destroy mobile command posts
 - J.3.5.3 Disrupt communications
 - J.3.5.4 Destroy/disrupt EW/GCI radars
 - J.3.5.5 Destroy/disrupt airborne command, control, and surveillance platforms
- J.3.6 Counter enemy ballistic missiles
 - J.3.6.1 Destroy TELs in the field and disrupt operations
 - J.3.6.2 Destroy TELs in garrisons and assembly areas
 - J.3.6.3 Destroy fixed TBM launchers
 - J.3.6.4 Destroy TBM storage areas
- J.3.7 Defeat attacking ballistic missiles
 - J.3.7.1 Destroy ballistic missiles in flight (active defense)
 - J.3.7.2 Warn friendly forces of attack (passive defense)
- J.3.8 Establish control of friendly airspace
 - J.3.8.1 Identify and track enemy aerial objects
 - J.3.8.2 Maintain deconfliction of friendly airspace
- J.3.9 Establish control of friendly space
 - J.3.9.1 Establish warning and surveillance systems
 - J.3.9.2 Defend friendly space operations

J.4 JOINT MISSION: Deny the enemy the capability to produce, store, or deliver weapons of mass destruction

Operational Objectives

Operational Tasks

- J.4.1 Destroy facilities producing and storing weapons of mass destruction
 - J.4.1.1 Destroy factories and weapons storage sites
 - J.4.1.2 Deny access to key sites
- J.4.2 Destroy means of delivering weapons of mass destruction
 - J.4.2.1 Defeat enemy air attacks
 - J.4.2.2 Limit generation of enemy air sorties
 - J.4.2.3 Defeat attacking ballistic missiles
- J.4.3 Deter the use of opposing weapons of mass destruction
 - J.4.3.1 Maintain credible threat of retaliation
 - J.4.3.2 Ensure survivability of US nuclear weapons and their control
 - J.4.3.3 Ensure US ability to operate in WMD environment

J.5 JOINT MISSION: Deny enemy national leaders the means of conducting military operations and controlling their nations

Operational Objectives

Operational Tasks

- J.5.1 Destroy facilities associated with the enemy's national and military leadership
 - J.5.1.1 Destroy/damage key directing organs and leadership cadres
 - J.6.1.2 Destroy leadership and security facilities
- J.5.2 Destroy/disable war-supporting industries and infrastructure
 - J.5.2.1 Disrupt national POL production, storage, distribution
 - J.5.2.2 Disrupt national power generation and distribution
 - J.5.2.3 Disrupt national transportation system
 - J.5.2.4 Damage/disrupt enemy's war-supporting industry
- J.5.3 Destroy/disable enemy communications networks and control systems
 - J.5.3.1 Disrupt/disable key telephone switching centers
 - J.5.3.2 Disrupt/disable fixed satellite ground stations
 - J.5.3.3 Disrupt/disable space-based satellite stations
 - J.5.3.4 Sever Landlines
 - J.5.3.5 Disrupt/destroy key communications nodes

J.6 JOINT MISSION: Deploy and support forces

Operational Objectives

Operational Tasks

- J.6.1 Deploy forces, support assets, and supplies to theaters of military operations
 - J.6.1.1 Move personnel and material into theater by air
 - J.6.1.2 Establish aerial refueling support system
 - J.6.1.3 Move personnel and material into theater by sea
 - J.6.1.4 Establish at-sea refueling and replenishment system
 - J.6.1.5 Establish navigation, geopositioning, and weather data systems
 - J.6.1.6 Establish communications support systems
 - J.6.1.7 Establish reconnaissance, surveillance, command control and attack assessment systems
 - J.6.1.8 Rescue personnel
- J.6.2 Deploy forces, support assets, and supplies within theaters of military operations
 - J.6.2.1 Move personnel and material within theater by air
 - J.6.2.2 Operate aerial refueling support system
 - J.6.2.3 Move personnel and material within theater by sea
 - J.6.2.4 Operate at-sea refueling and replenishment system
 - J.6.2.5 Operate navigation, geopositioning, and weather data systems
 - J.6.2.6 Operate communications support systems
 - J.6.2.7 Operate reconnaissance, surveillance, command control and attack assessment systems
 - J.6.2.8 Rescue personnel

J.7 JOINT MISSION: Gain Information Superiority

Operational Objectives

Operational Tasks

- J.7.1 Protect Coalition C3ISR Systems
 - Establish continuous, fused picture of battlespace
 - Protect C3ISR assets from physical attack
 - Neutralize enemy C3ISR penetrations
 - Deny enemy knowledge of friendly intelligence operations
- Degrade Enemy C3ISR
 - Degrade enemy picture of battlespace
 - Destroy/disrupt enemy C3ISR assets with physical attack
 - Penetrate enemy C3ISR systems with cyber attacks
 - Gain knowledge of enemy intelligence operations

Command and Control and Force Element Functions

Monitor

- Receive, monitor, integrate, and display data from all sources
- Monitor status of global actions, critical events, crisis areas
- Monitor physical environment conditions
- Monitor status of friendly forces
- Monitor status of non-friendly forces
- Monitor rules of engagement, treaties, and agreements

Assess

- Determine and assess the nature and impact of critical events
- Assess friendly and non-friendly force and resource status
- Determine the military implication of shared intelligence indicators, all source information, and orders of battle
- Assess events relative to ROE, treaties, and agreements
- Assess friendly and non-friendly operations and results
- Assess termination options, conditions, and proposals

Plan

- Formulate operations objectives
- Merge, generate, and tailor force list and force movements requirements
- Develop potential COAs/plans
- Evaluate proposed COAs/plans
- Select COA/plan

Execute

- Execute COA/plan
- Disseminate information

Appendix B

Joint Mission Framework: Peacekeeping/Peace Enforcement

Joint Mission

Operational Objective

Operational Task

Establish and defend safe areas

Protect safe areas against external threats

- Destroy/neutralize hostile artillery, mortars (w/aircraft, artillery, SOF, ...)
- Deny infiltration (w/recce units, helos, infantry...)
- Disrupt and stop infantry and armor attacks (w/armored units, aircraft...)
- Disrupt and stop air attacks/establish "no fly" zones (w/aircraft, SAMs...)
- Establish positions at key sites nearby safe areas (w/armored, infantry units...)
- Destroy/neutralize key sites (w/aircraft, artillery...)
- Rescue personnel in hostile areas (w/aircraft, helos...)

Maintain law and order within safe area

- Ensure the enforcement of local laws/regulations (w/mil police...)
- Ensure the dispersal, containment or elimination of crowds (w/infantry...)
- Deter/discourage banditry (w/mil police...)
- Establish/reconstitute local police authorities (w/mil police...)

Defend safe areas against internal threats

- Locate/monitor activities of violent factions (w/SOF, HUMINT...)
- Prevent or eliminate terrorist attacks (w/1 SOF, foot patrol units...)
- Eliminate snipers, particularly in urban terrain (w/SOF, infantry...)
- Eliminate SAMs, particularly in urban terrain (w/SOF, self defense...)
- Protect key facilities/supplies from sabotage (w/infantry, elec surv,...)
- Reduce/clear mines/minefields (w/sapper units,...)

Gain support of local populace

- Establish public information/community outreach campaign
 - Ensure information dissemination (w/PA, PSYOP units,...)
 - Establish and support community development programs (w/PA, PSYOP units,...)
- Ensure provision of essential goods and services
 - Distribute food and water (w/infantry, acft, ships,...)
 - Establish medical and dental care (w/medical corps,...)
 - Establish temporary shelters (w/engineers,...)

Gain control of movement across and within borders

- Ensure proper flow of goods and personnel across international borders
 - Find/monitor key illegal supply and infiltration routes (w/acft, recce units, ships,...)
 - Disrupt transportation of unauthorized goods and confiscate/destroy (w/SOF, infantry, ships, acft,...)
 - Locate and prevent entry of unauthorized personnel (w/mil police,...)
- Maintain freedom of movement on key routes
 - Protect convoys of supplies/personnel in unsecure areas (w/infantry,...)
 - Reduce/clear mines and remove roadblocks (w/sappers, engineers,...)

Protect critical LOCs and debarkation points (w/infantry, mil police,...)

Joint Mission

Operational Objective

Operational Task

Render humanitarian assistance

- Protect delivery of food and medical supplies to distribution points

 - Protect convoys (w/infantry, helis,...)

 - Protect relief flights (w/acft,...)

 - Protect relief ships (w/ships, acft,...)

 - Protect ports of entry, storage areas, and key distribution points (w/mil police, infantry, elec surv...)

- Ensure basic services

 - Distribute food and water (w/infantry, acft, ships,...)

 - Establish medical and dental care (w/medical corps,...)

 - Establish temporary shelters (w/engineers,...)

- Rescue civilians in distress

 - Rescue persons in areas of difficult ingress/egress (w/helis, acft,...)

 - Rescue persons trapped in collapsed structures (w/engineers,...)

 - Insure immediate medical attention to the injured (w/medical corps,...)

Reconstitute civil authority and infrastructure

- Ensure reconstitution of government

 - Support plebiscites, referenda and/or elections

 - Support reconstitution of all branches of government

 - Support reconstitution of judiciary and penal system

 - Support establishment of local political bodies

- Support government provision of needs of its people

 - Promote public health, safety, welfare, and education services

 - Ensure food supplies and availability of agriculture components

 - Promote trade and commerce functions

 - Promote administration and finance functions

- Support repair of key components of national infrastructure

 - Establish essential transportation infrastructure (w/engineers,...)

 - Establish/support local defense forces

Ensure the implementation of peace agreement/cease-fire

- Separate factions

 - Deploy US/UN forces in territory between factions

 - Observe activities/movements of factions

 - Prevent/neutralize attacks of one faction against another

- Ensure disarmament of factions

 - Seize/destroy illegal weapons caches

 - Ensure withdrawal/cantonment/destruction of heavy weapons

 - Deny major movements of arms into and within territory

- Support adherence to the agreement

 - Insure resolutions to implementation disputes at local level

 - Support the resolution and punishment of violations

Ensure exchanges of POWs, casualties
Support care and repatriation of refugees