System Integration Guide: Project Management

The purpose of this document is to outline the steps involved in implementing a MPSAV programmed control system into your projects. This is intended to give the AV Integrators an idea of the entire process and detail what Integrators should expect during all the stages of development. These steps are all part of the process that MPSAV uses to give you a turnkey software solution for your project, and deliver what you are expecting, that meets the clients requirements, and will make the project progress as smooth as possible for the AV Integrator, MPSAV, and most importantly, the end user (or client).

Some of the steps outlined below may not be applicable to your project, but most will be. Sometimes, the steps outlined do not occur as separate steps but groups of steps. Not all projects are equal, and not all projects are of the same size and scope, which means some projects will not necessarily follow these steps exactly. Accelerated time-lines, engineering problems, and other factors can effect the exact process, but using this guide will help Integrators know what MPSAV needs in order to do "what we do".

MPSAV in most cases uses the "Waterfall" development cycle. This basically means that each step in the development cycle is dependent on completing the prior steps first, in a sequential order. If a prior step is required for a project, and hasn't been completed, or information is still pending, then the next step in the process cannot proceed until the other steps are completed. For example, actual code programming can't be started until after all scope requirements and drawings have been submitted. Internally, MPSAV often uses other "Agile Development" processes, but most of the interaction that an AV Integrator has with MPSAV with follow sequential steps in most cases.

STEPS OF THE DEVELOPMENT CYCLE:

I. REQUIREMENTS PHASE:
1) AV INTEGRATOR: Request Quote – The request for quote to MPSAV must include some basic information at the least, and preferably more detailed information about the project if it is available at the time of quote. Documents that should be submitted (if avail), include:
  – Name and Location of Project: The name or company that the system is for, and city/state that they are located in.

- Description of system: This would be the general name of the system. Room name, room number, type of room, or something that seperates this room from other possible rooms at the client's site.
- Functionality Scope of Work: This is a general description of the room and how it's going to be used. Often times this is the description that is given to the client in the AV Integrator's system proposal.
- System Drawings: This can be full CAD's, or consultant drawings, or even Visio mockups. Whatever documentation that you have for system wiring done in whatever application you are used to using.
- Consultant Specification Doc: Applicable when the system design is done by a consultant, whereby a specification document is usually provided that specifies the scope and functions that the system is expected to perform to.
- Equipment List of System: The main pieces of gear in the system, most importantly the controlled devices, but most major pieces of AV gear. If exact model names/numbers are not determined yet, that is ok, but a general list will help. On smaller or simpler systems, often the system drawing can function as a working equipment list (provided the drawings are accurate and list the make/model of the equipment).
- Estimated Project Time-line: The estimated completion date that the client is expecting or that the AV Integrator is targeting. Often a general range of dates might include when hardware install and wiring is scheduled, so that a general target date can be determined for when the software would need to be turned over and completed.

2) MPSAV: Submit Programming Formal Quote – MPSAV will use the documents and information submitted for the RFQ and provide a detailed software quote for the entire project from start to finish. This will include off-site development, on-site development, touch panel design, system configuration and setup. In addtion testing and debugging are included in the scope of work. The scope will have descriptions of all rooms, and controlled equipment along with a list of all the functions that will be supported (or controlled) on each device. If functionality is missing from this list, bring it to the attention of MPSAV and a revision will be re-submitted with corrected information.

3) AV INTEGRATOR: Accept Quote – If the AV Integrator is satisfied with the proposal, and wants to move forward with the project and start the development process, then the proposal needs to be signed and returned to MPSAV. May AV Integrators work on a PO system, so if a PO is necessary on the Integrator's side, a PO should be issued to MPSAV at this time so as to move the project into development phase.

II. DESIGN PHASE:

4) MPSAV: Submit Touch Panel Layout Design Mockups – The first process in the development phase is the creation of the touch panel layout (ie: the graphic user interface or GUI). MPSAV will design an intuitive interface that is custom to the system. The first iteration of the GUI layout will be submitted to the AV Integrator for review and approval. In many cases, the End User can be involved and also

give their input into potential issues, problems, or suggestions for changes needed in the final layout. The feedback received will be discussed more in detail to work out any conflicting issues and implemented where appropriate in the design.

5) AV INTEGRATOR: Touch Panel Layout Approval – The touch panel GUI layouts need to be approved by the AV Integrator and/or End User before before the next phase in development can commence.

III. IMPLEMENTATION PHASE:

6a) MPSAV: Off-Site Software Development– This is heart of the development process. MPSAV starts working on the actual code and module blocks and creating the program. Usually this process happens concurrently while the AV Integrator is installing the system in the step below.

6b) AV INTEGRATOR: Complete System Installation – The AV Intetrator usually installs the system concurrently with the previous steps and while the program is being created. Communication between the AV Integrator and MPSAV should be made with regards to expected completion dates, and when the system will be ready for software commissioning. The system should be checked for proper operation and signal flow to all devices by the AV Integrator prior to Software Commissioning. For example, all audio and video signal paths to room displays should be checked by manual operation of the equipment to ensure as many install issues are worked out so as not to complicate the software commissioning and testing phase.

7) MPSAV: On-Site Software Commissioning – This is where MPSAV brings the completed software and touch panels out to the site, and configures, loads, tests, and debugs the control system and ensures all portions of the program are in working order. This process can take anywhere from a few hours on a small system, to a few days on a larger system, or even weeks on multi-room systems or whole buildings. You wil have an estimate of the this time before hand to help schedule and coordinate this portion of the project. It is also beneficial to plan on having at least 1 installation tech on-site during software commissioning, as often times during the testing, it is found that cable pin-outs are different than expected, or other troubleshooting steps need to be taken related to hardware and field wiring. Having a tech on site to correct any problems as they are discovered will help the commissioning process go smoother and faster.

IV. VERIFICATION PHASE:

8) AV INTEGRATOR: System Testing & Punch-list – After MPSAV has completed the software commissioning and testing/debugging phase, this is where the AV Integrator and often times the end-user go through the system, checking the system to make sure it works the way they expected. Often times, End Users are encouraged to use the system a couple times in a real or mock scenario to make sure that the control system supports the way they want and need to use the AV system. On smaller systems, this can often be done on the same day as commissioning, or at the end of the commissioning process. For larger, more complex systems, this process can take the AV Integrator and/or end user several days or more. MPSAV does it's best to ensure the software you get turned

over is free from "bugs", but it is custom software, and often times issues do not present themselves during initial testing. If any issues are found by the AV Integrator or End User during this phase, notes of the problem and what led up to the problem should be noted, so MPSAV can determine if a software patch needs to be implemented to fix the problem.

9) MPSAV: Punchlist Corrections – If punch-list items relating to software functionality are remaining after AV Integration testing, then a new visit or software revision will be made to correct any resolvable issues and make any minor corrections or changes necessary to fulfill the scope of work

10) AV INTEGRATOR: End User Turn Over & Training – Finally the AV Integrator can do their normal End User Turn Over procedure that they are familiar with at the end of a successful project. Because Control systems are often the only component that the End User will interact with, often times training sessions or materials are offered by the AV Integrator to the end-users responsible for the system, to demonstrate what the system can do, and how to do it. While MPSAV takes every measure to make our control system software solutions easy to use and intuitive to require little to no training to operate, however, let's face it, some systems are still very complex, and many consultants often request features that the end user isn't aware of until they are shown. So some systems might still need some training for the End User to be comfortable with operating and supporting other staff members using the system. MPSAV is available to help out with the training sessions and or training documentation/manuals for the control system if requested, and at additional charge. Please contact us, or let us know when requesting a quote if you would like this included.