Business Unit – Digital Systems

Nextopia **Platform** Group

[real product name has been changed]

Software
Organization Manual

[edited for public use]

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[Company]

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Table of Contents

1   Overview

This Organization Manual defines the Nextopia Platform Group (NPG) software organization (NPG-SW). Its purpose is to provide a common language by which we talk and think about our organization – why we exist, what value we add to the company, and how we are positioned within [Company].

1.1   Purpose

The NPG-SW Organization Manual defines the responsibilities and composition of each part of the NPG software organization. It introduces new employees to our organizational structure. It is intended to eliminate confusion about who does what job, and to help us operate more efficiently and professionally. Finally, the manual relates the NPG-SW organization and functions to the concepts of Capability Maturity Management [2].

1.2   Scope

This Organization Manual addresses the *software development* activities and organization within the overall Nextopia Platform Group. The manual does *not* address non-development activities such as Human Resources, organizational finance, and administrative policies, nor does it address non-software activities such as marketing, IC design, and PCB design.

1.3   Future Reference

This first edition of the NPG-SW Organization Manual includes the names of many individuals assigned to particular roles – in part because, at this writing, most readers are more likely to recognize the individuals than the positions.

Given the frequent changes that occur in any dynamic organizations, these assignments to individuals will be greatly reduced in subsequent editions of the Org Manual.

To remain informed of the most recent organization structure and assignments, please consult the NPG intranet web site.

2   Vision and Strategy

The Digital Systems business unit has a vision of the consumer world in the near future, in which everyone is always connected to information, entertainment and services.

The mission of Digital Systems is to become the leading semiconductor systems solution provider for digital consumer application in the "connected home."

The world of broadcasting and communications is changing dramatically due to the emerging digitisation of the downstream chain. This trend opens the door for totally new technical, functional, and business approaches. No longer can the worlds of television and the computer (including the Internet) remain separate. Audio and video are becoming simply data, and can be freely mixed and manipulated along with any other type of data.

Products emerging in this new era are based on new technology and require dramatically increasing investments in specialized integrated circuit boards and in software. Not only is a large part of the functionality of new products embedded in the product software, but mechanisms are becoming available to update the software in the field, thus enabling the product to change its functionality at runtime.

This merging of the worlds of television and the PC and the Internet introduces a need for totally different skills in the design, implementation, test, and verification of new consumer products. Examples include designing high-speed digital hardware, developing embedded AV platforms, and designing software that enables field upgradability of consumer devices.

The general strategy of the Digital Systems business unit is to:

1. Focus on the vision of the connected home.
2. Leverage experience in consumer electronics, connectivity, identification, and communications.
3. Target consumer devices characterized by rapidly changing formats and standards that yet need to meet consumers' expectations of many years of useful life, especially in the areas of:
    - Network Digital Television
    - Satellite & Cable Set-top Boxes
    - Home Media Centres
    - Convergence Devices

To capture as many opportunities as possible, [Company] Semiconductors increasingly develops and markets complete systems (Systems-on-a-Chip or SoCs) and product families, which are designed for adaptation and re-use in multiple products. **Nextopiaä** is the trademarked name for the company's current digital audio-video platform. The Nextopia Platform is built around an architecture featuring a media processor and a separate control processor integrated onto a single chip.

The Nextopia Platform Group is the organization charged with developing the hardware and software of the Nextopia platform. NPG-SW is the software group within the NPG.

3   Organizational Context

[The Company], headquartered in [undisclosed location], employs [an undisclosed number of] employees in more than [many] countries. With sales of around $[x] billion in 2001, [the Company] is one of the world's top semiconductor suppliers. We are a leader in complex silicon systems for consumer electronics, telecommunications, automotive, computer peripherals and networking. Additionally, we are a volume manufacturer of semiconductors for multi-market products.

Producing and supporting more than [x] million integrated circuits and discrete devices daily, [Company] has [x] manufacturing and assembly sites, [x] design centers, four system labs and more than [x] offices. Manufacturing facilities are in the USA, the Far East and Europe serving customers worldwide.

[Company], headed by [the CEO], comprises several divisions, of which one is "Digital Systems" headed by [unnamed] – as shown below in Figure 1.

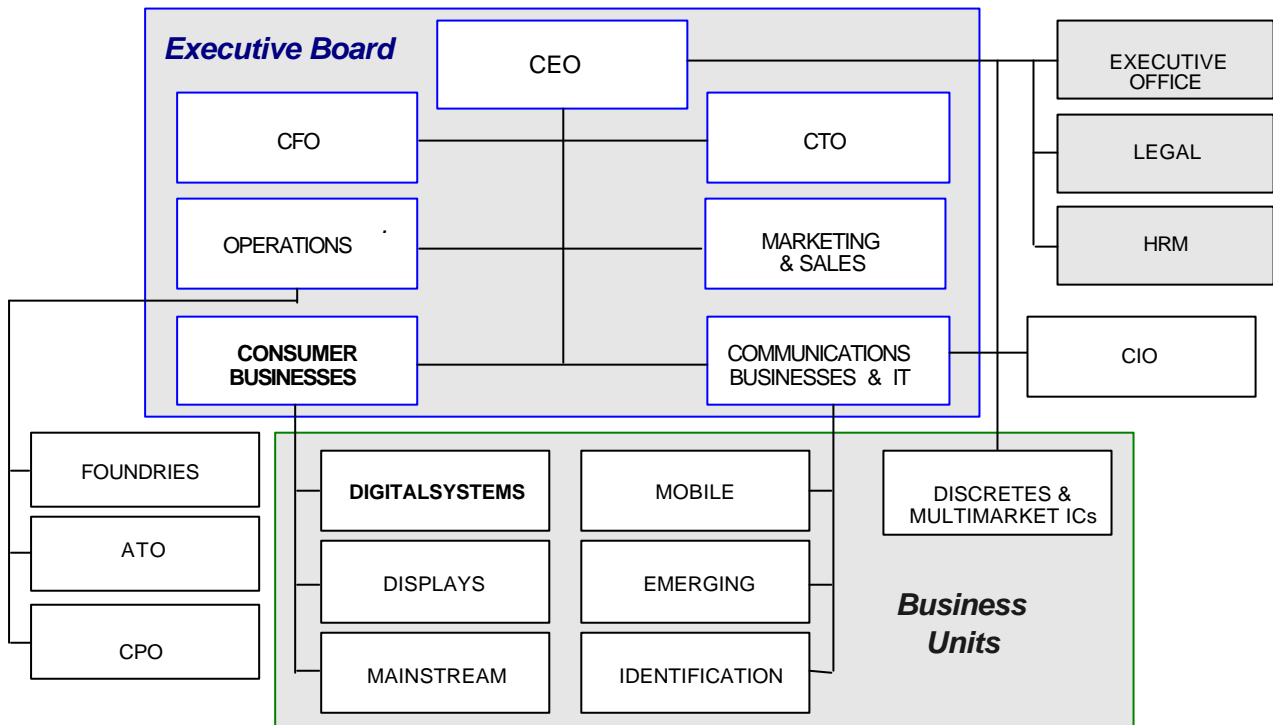*Figure 1. [Company] Organization*

Consumer Businesses area divided into **Business Units**, of which one is the Business Unit (or BU) "Digital Systems."

The BU Digital Systems consists of three **Business Lines** and the Nextopia Platform Group – the organization charged with developing the systems solutions required by the Business Lines for their new business development. This is shown in Figure 2.

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                          ┌──────────────────────────────────┐
                          │      Consumer Businesses          │
                          └──────────────────────────────────┘
                  ┌─────────────────────┐       ┌─────────────────────┐
                  │  B U S I N E S S     │       │  B U S I N E S S     │
                  │     U N I T          │       │     U N I T          │
                  │    DIGITAL           │       │  MAINSTREAM          │
                  │    SYSTEMS           │       │  CONSUMER            │
                  │                      │       │  SYSTEMS             │
                  └─────────────────────┘       └─────────────────────┘
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| BL STORAGE | BL BROADBAND HOME SERVERS | BL MEDIA PROCESSING | BUSINESS DEVELOPMENT | MAIN STREAM TV SOLUTIONS |

| MST Digital TV | Broadband System Solutions | **Nextopia Platform** | | Innovation Manager |

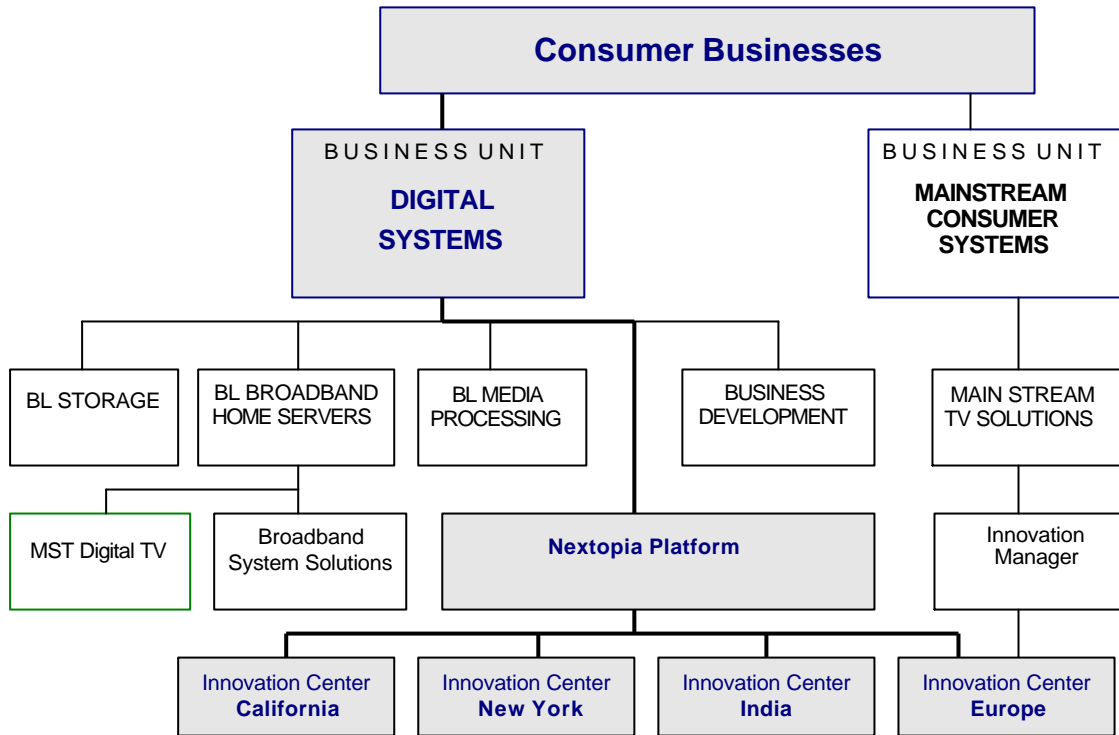| Innovation Center **California** | Innovation Center **New York** | Innovation Center **India** | Innovation Center **Europe** |

Figure 2. The Nextopia Platform Group in Organizational Context

At the Innovation Center Europe, the Nextopia platform development team is part of a larger development organization, as shown in the diagram below:

[figure removed]

Figure 3. Innovation Center Eindhoven

4   Platform Management Team

The Nextopia Platform Group is headed by [name removed].

Senior staff positions reporting directly to the Chief Architect & Innovation Manager include the following:

- Software Architect
- VLSI Architect
- Senior Technology Strategist
- Connected Home Strategy
- Platform Program Manager
- Methodology & Tools
- Financial Controller

These functions, together with the Innovation Centers at New York, California, Europe, and Bangalore, make up the Nextopia Platform Group.

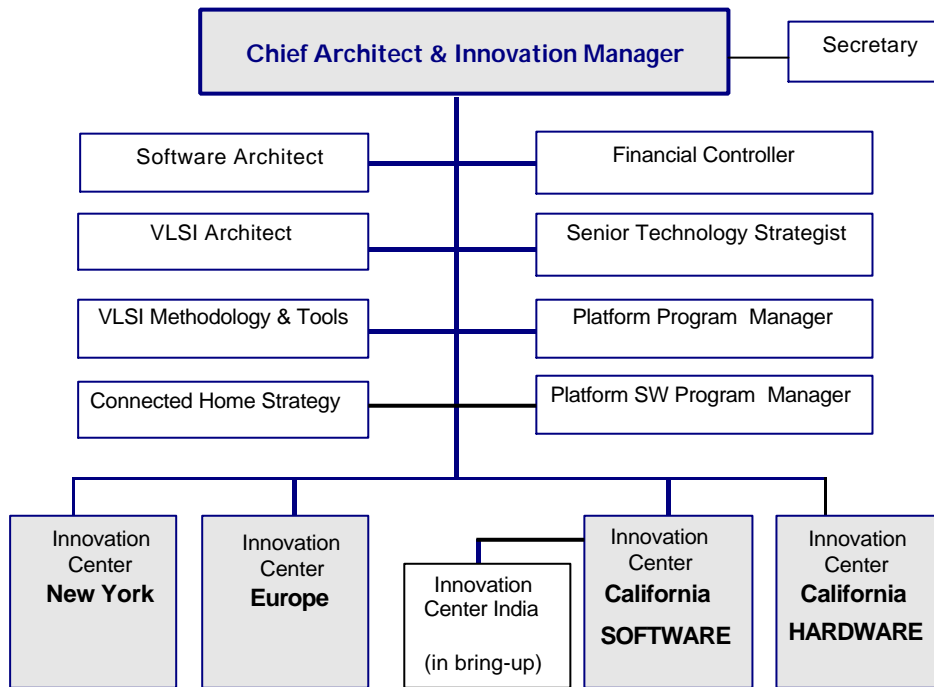The hierarchical reporting lines of the NPG management team are shown as follows:

Figure 4. Nextopia Platform Group Management Team

5   Matrix Management

In order to meet its development objectives, the NPG-SW organization has adopted a matrix organization, which presents three dimensions to an employee:
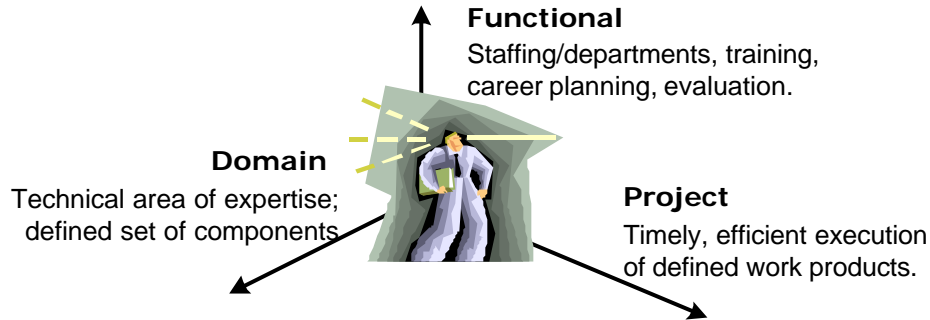

Figure 5. Dimensions of NPG-SW Matrix Management

Each dimension has unique responsibilities in staff development, technical expertise, and the timely completion of projects. Individual employees have a reporting relationship to at least one, often two, and sometimes all three of these dimensions.

5.1   Introduction

The responsibilities associated with the three dimensions of the NPG matrix management system may be summarized as follows:

A **Functional Manager** has the responsibility to:
- Hire employees to fill needed skill areas in a department.
- Direct each employee's development, training, and career planning.
- Assign each employee to one or more projects.
- Address issues affecting department staff members at one location.
- Conduct each employee's annual performance review.

A **Domain Leader** (normally an architect) has the responsibility to:
- Maintain a "road map" of a technical area of expertise and related set of components.
- Coordinate the domain roadmap with the overall platform architecture roadmap.
- Define the skill sets needed for the domain; advise on hiring and assignments.
- Monitor domain-related implementations in projects

A **Project Manager** (directly or through Project or Sub-Project Leads) has the responsibility to:
- Define the requirements, scope, deliverables and planning for a project.
- Assure completion of the project on time and within budget.
- Set priorities for Sub-Project Leaders and/or individual project team members.
- Provide input for employees' annual performance reviews.

Each dimension is described in greater detail below.

5.2 Functional Management

Functional management is responsible for hiring staff members, ensuring their skills and career development, assigning them to projects, and evaluating their performance. From an employee's point of view, functional management provides continuity over longer periods of time, as distinct from project management, which begins and ends with initiation and conclusion release projects.

5.2.1 Functional Org Chart

[figure removed]

Figure 6. Functional Management in the NPG Software Organization

5.2.2 Functional Teams at Locations

For practical reasons, functional management acknowledges geographical location, in effect providing a lower level of hierarchical organization. Functional teams often (but do not necessarily) match domain or project teams. As of this writing, the functional teams in place (with numbers of staff) are:

California	Europe	New York

• Architecture & Adv. Devel. (12)
• Development Support (9)
• Digital Audio (6)
• Digital Video (14)
• Project Management (4)
• System (13)
	• Video
	• DVP2API
	• Natural Motion
	• Nextopia Support
	• Storage
		• Project Management (1)
		• Software
		  - IRDM (7)
		  - Platform Enhancement (10)
		  - Release Team (3)
		• Systems Engineering
		  - Reference Hardware (6)
		  - Integration & Verification (12)
		• System Architecture (4)

Note that the Hardware team is also present in California.	*Software groups for other business units & business lines are present (Fig. 3).*	*Also present is the "Reference Hardware" team.*

5.2.3   Functional Roles and Responsibilities

The roles and responsibilities of the key positions comprising the functional or hierarchical management of the NPG-SW group may be summarized as follows:

Role	Responsibility	Currently Assigned
Chief Architect & Innovation Manager	• Defines and guides the implementation of the Nextopia Platform mission, vision, and strategy. • Chairs the NPG management team.	[name removed]
[Location] General Manager	• Participates in NPG management team • Sits on Software Program Board (SPB). • Leads local management team. • Directs functional managers. • Assigns personnel to projects. • Responsible for location management.	[names removed]
Platform Software Development Manager	• Assures proficiency of engineers in the domains identified for the location. • Assures deployment of platform and supportive local "ways of working." • Sets objectives, budgets, policies, • Maintains Consolidated Resource sheet • Sits on Software Program Board (SPB).	[name removed]
[Location] Software Development Manager	• Participates in platform management team (Software Program Board). • Defines, deploys, and monitors software development processes. • Administers objectives, policies, budgets, & allocations. • Conducts performance reviews.	[names removed]
Functional Team Leader	• Directs non-project activities of functional team members. • Provides input to Functional Manager on employee's performance. • Reports to Functional Manager. • May be a Domain or Project Leader.	[names removed]

5.3   Architecture & Domains

A "domain" is an area of specialized technical knowledge, which typically corresponds to a coherent set of software components. Domains are created around inter-related technical functions. For example, MP3 decoding, automatic volume control, etc., can all be included in one domain because they are all functions that deal with audio signal. Architectural priorities for all domains are communicated through the organization's architects, as shown along the left side of Figure 7.

[diagram removed]

Figure 7. Hierarchy of Architecture and Domain Expertise

5.3.1   Domains and Projects

When a component is included in the plans for a given product, the development work in that domain must be tied in with the deadlines and deliverables of the project as a whole. The intersection between a domain and a deadline is a Sub-Project, represent the domain-related work for a given project release.

	Project 1	Project 2
Audio Domain	**Project 1 Audio** SUB-PROJECT	**Project 2 Audio** SUB-PROJECT
Video Domain	**Project 1 Video** SUB-PROJECT	**Project 2 Video** SUB-PROJECT
Infra Domain	**Project 1 Infra** SUB-PROJECT	**Project 2 Infra** SUB-PROJECT
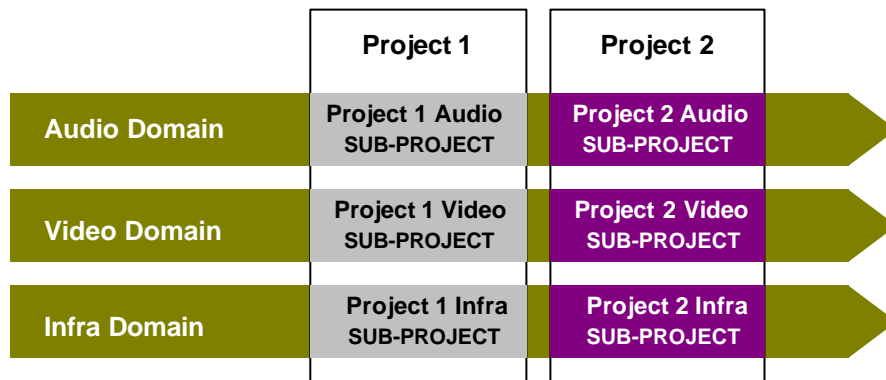
Figure 8. Intersection of Domains and Projects

5.3.2   Architecture & Domain Roles and Responsibilities

The roles and responsibilities for all software architects and domain leaders may be summarized in the following table:

Role	Responsibility	Currently Assigned
All software architects	For a defined domain(s): • Define high-level design of software. • Define sub-structures, and selects key elements of system design. • Document vision, strategy, & approach. • Define interfaces within the domain and with external domains. • Guide developers on implementation. • Advise on development environment. • Monitor & reviews implementation. • Define roadmap of future developments.	

Role	Responsibility	Currently Assigned
BU Software Architect	Defines all architectures for the Business Unit Digital Systems, including present and future platforms.	[name removed]
Nextopia Platform Software Architect	Addresses all architecture issues (see above) for the Nextopia Digital Video Platform.	[name removed]
Project Architect	(see section 5.4.2 below)	(See project websites)
Domain Leader	• Address all architecture issues (see above) for an approved Domain. • Collaborate with Project Architect in defining the architecture of a Project. • Coordinate multiple project architectures to assure continuity, consistency, and efficient development. • Coordinate domain-related work across multiple locations. • Ensure harmonization of domain architecture with platform and organizational architecture roadmap. • Act as key "point of contact" for user documentation.	(For individual assignments, see the website.)

5.3.3   Domain Management

The Software Architecture Board (see section 6.3) establishes the approved set of high-level domains, which implies a corresponding set of components under development.

Each domain has three types of management associated with it:

- The **domain architect** is responsible for technical consistency, re-usability, etc., of work products created within the domain.
- The **domain manager** is responsible for assigning work within a domain, road mapping, defining skills needed, and providing advice on hiring.
- The **functional manager** is responsible for hiring, training and career planning, assignment to projects, and conducting annual performance reviews.

At this writing, the following were the approved domains, along with the designated architects, domain managers, and functional managers:

Domain Name	Domain Architect	Domain Manager	Functional Manager	LOC	Notes
Audio	[name removed]	[name removed]	[name removed]	ICS	Has people in BLR
dvpAPI-2	[name removed]	[name removed]	[name removed]	ICE	Includes connection manager. In future, distribute over other domains and platforms. Done for Infra.
Infrastructure	[name removed]	[name removed]	[name removed]	PID	Includes "some" of IPC.
IRDM	[name removed]	[name removed]	[name removed]	ICB	Includes Teletext inserter.
Kernel	[name removed]	[name removed]	[name removed]	ICS	Includes Boards, pSOS, TM, some of IPC, some of SAS
Peripherals	[name removed]	[name removed]	[name removed]	ICS	Includes Graphics.
SDE2	[name removed]	[name removed]	[name removed]	RTG	
Storage	[name removed]	[name removed]	[name removed]		Future use for DVD, HDD.
Integration & Verification	[name removed]	[name removed]	[name removed]	ICB	
Tools	[name removed]	[name removed]	[name removed]	ICB	Includes parts of SAS.
TSSA	[name removed]	[name removed]	[name removed]	ICS	TSSA-1 to be replaced by TSSA-2.
User Docs	[name removed]	[name removed]	[name removed]	ICB	
Video	[name removed]	[name removed]	[name removed]	ICE	[name removed]
Video Nat Mot	[name removed]	[name removed]	[name removed]	ICE	Subdomain of Video
Vxworks	[name removed]	[name removed]	[name removed]	PID	

5.4 Project Management

The third dimension (after the functional and domain axes) of the NPG-SW management structure is Project Management. The Nextopia Platform Group has one *program*, developing the Nextopia platform, which is divided into major *projects*. In practice, a project is roughly equivalent to a release of a software package. The purpose of Project Management is to assure the delivery of a specified work product, on time, within budget, at an agreed level of quality.

To co-ordinate multiple projects and the allocation of resources need to complete them, the Nextopia Platform Group has established a *Program Manager* to oversee all platform software development. The Program Manager reports directly to the Chief Architect & Innovation Manager.

5.4.1 Project Management Org Chart

The reporting structure of the Project Management roles in NPG-SW can be diagrammed as follows:

[diagram removed]

Figure 9. NPG-SW Project Management Structure

A project is typically divided into Sub-Projects, with each Sub-Project headed by a Sub-Project Leader. Some projects may include an overall "Project Lead" assisting to the Project Manager across all Sub-Projects, or interacting with all team members directly. Given the definition of projects as the intersection between domains and deadlines, it follows that domain and project roles tend to overlap:

- A Sub-Project is defined as the work required in a given domain for a given project. Thus, in many projects, the Project Lead and the Domain Lead are the same person.
- Depending on the architecture of the system being built, the Sub-Project may also correspond to a Subsystem or component (or set of components) in the final system product.
- A Sub-Project Lead may be responsible for more than one domain in a project.
- A Domain Lead may be responsible for more the components of that domain in more than one project.
- Domains may have sub-domains (e.g., Video has a sub-domain of Natural Motion).

5.4.2   Project Management Roles and Responsibilities

The roles, responsibilities, and current assignments for key functions in the project management structure of NPG-SW may be defined as follows:

Role	Responsibility	Currently Assigned
Program Manager	- Participates in platform management team. - Defines, maintains, and sets priorities for the organization's "portfolio" of software projects. - Creates a "roadmap" and master schedule for all software projects, coordinated with IC development and MST schedules. - Coordinates all projects in relation to roadmap and master schedule. - Resolves conflicts between projects when necessary; refers conflicts to the SPB when appropriate. - Presides over the Software Program Board (SPB) and Project Management Board (PMB). - Ensures that project managers follow correct CMM processes. - Reports on the progress of all projects to senior management.	[name removed]
Project Manager (PM)	- Accepts (may help define) requirements. - Develops top-level Project Management Plan (PMP) with sub-project leads; reviews sub-project plans. - Drives the project to remain on schedule and under budget. - Sets priorities for sub-project leaders. - Tracks and reports on project progress. - Reports to Program Manager - Sits on the Project Management Board (PMB).	[name removed]
Project Lead (PL)	- Works as a "second in command" to Project Manager. - Works with the Project Architect to implement the technical aspects of a project. - Works to assure integration of deliveries from multiple sub-projects or other teams. - Supervises the work of the Sub-Projects.	For current assignments, see project websites.
Sub-Project Lead (SPL)	- Defines sub-project requirements, tasks, and resource needs. - Responsible for day-to-day technical progress of the sub-project. - May also be a domain leader. - Sets priorities for individual developers. - Reports to Project Manager.	For current assignments, see project websites.
Project Architect	- Responsible for the technical content of a project. - Assures consistency and appropriateness of the features & functions of each release. - Writes the Functional Requirement Spec (FRS) and System Architecture Description (SAD) - Verifies & approves user documentation.	For current assignments, see project websites.

5.5   Support Roles

In addition to the roles directly involved in developing code for a project, various support functions are provided – differently in each location – to support developing product software. Some of these roles are found in all three locations; some are found at only one or two; still others are found at one location but serve a defined purpose for more than one location.

Support roles found in at least one location include the following:

- Quality Manager
- Configuration Management
- Release Management
- Nextopia Support Team – customer service
- Documentation
- Web Site Maintenance
- Testing
- Integration & Validation
- Reference Hardware

5.6   Current Assignments

The functional organization of software engineers within each location varies according to the rest of the site's structure, the location's history, and the preferences of the site management team.

Given the expectation that individual assignments are likely to change fairly often at all locations, this manual omits specific job assignments below senior management.

To see the current assignments at each location, please consult the Attachment to this document, or consult the NPG organization website.

6   Managing Boards

To address the complexity of the situation and assure efficient, coordinated effort toward the overall goals of the business line, the Nextopia Platform Group has established a number of managing "boards" to oversee and direct software development within the NPG-SW, namely:

1. Software Program Board (SPB)
2. Project Management Board (PMB)
3. CMM Coordination Team (CCT)
4. Software Architecture Board (SWAB)

6.1   All Boards

All management boards have the following characteristics:

- Each board has a "charter" defining its purpose.
- Board members are all stakeholders in the matters decided by the board.
- Each board has a designated *chair* and a designated *recording secretary*.
- Each board "meets" regularly – usually every week, and normally via teleconference for at least some participants. Given our geographical concentration in three time zones, the most practical times for 3-location teleconferences are:

Teleconference Times	Pacific Time	Eastern US Time	European Time
"Golden Hour"	8 AM	11 AM	1700
"Dinner Hour"	11 AM	2 PM	2000

(The "Golden Hour" is the one time when normal office hours intersect in all three time zones; the "dinner hour" allows European participants to have dinner at home and then call in.)

- Each board publishes meeting minutes, which are circulated among members and posted on the board's web site.
- Each board has a [Company]-public website, maintained by the General Editor. The website gives access to key documents (approved or under review), status reports, a list of members, and minutes of meetings – plus any other information deemed potentially of interest.
- Detailed, current information on all boards can be found at the Nextopia Platform Group website.

The "generic" roles for the members of all governing boards may be summarized as follows:

Role	Responsibilities
Chair	• Define and implement the SPB charter. • Convene board meetings. • Serve as primary contact to supervising board and/or subordinate boards. • Handle requests addressed to the board.
Secretary	• Record the decisions made at each meeting. • Capture results in written minutes. • Disseminate written minutes via email and board's website.
Member	• Attends scheduled board meetings. • Represents a given domain, team, project or organizational role. • Assure communication of board findings to represented team.

6.2   Software Program Board (SPB)

The Software Program Board (SPB) is the authoritative board, established to assist management in carrying out their individual responsibilities. As such, the SPB is the committee that coordinates and executes the software responsibilities within the Nextopia Platform Group.

The SPB is charted by, and reports to the Chief Architect and Innovation Manager of the Nextopia Digital Video Platform Group.

6.2.1   SPB Responsibilities

The **Scope** of the Software Program Board is: All activities necessary to plan, organize, execute, and control the software activities within the Nextopia Platform Group needed to achieve the organization's business objectives. This includes interfacing with the Business Line (BL), Marketing Segment Teams (MSTs), and other groups to define roadmaps and technical approaches for meeting organization business objectives.

The **Responsibilities** of the Software Program Board are: To deliver the plans and software work products needed to meet overall organization business objectives.

According to the charter, the SPB is responsible for:

- Internal organization, i.e. assignment of responsibilities to persons and/or sites
- Process introduction, implementation and improvement (via the CCT)
- Overall platform software roadmap, driven by the Business Lines (via the SWAB)
- Realization of the software roadmap through a series of Pre-Development Projects and Development Projects, some of which may be delegated to the PMB or SWAB.
- Control of the organization's budget and resource allocation (partially via the PMB)
- Assurance of software and product quality (via the CCT and the Quality system)

In addition, the SPB undertakes the following:

- Setting of organizational priorities, and resolving conflicts as they arise.
- Ensure proper organization and execution of the main OSRP milestone reviews (gates) by the Projects.
- Review of the Projects Portfolio sheet (owned by the Program Manager) and the Consolidated Resource Sheet (owned by the Development Manager).

6.2.2   SPB Representation

As instituted in the SPB charter, membership in the SPB includes the following areas of representation.

- BU Software Architect
- BU Business Development
- NPG-SW Program Manager (Chair)
- NPG-SW Development Manager
- General Managers – of each Location
- BL Broadband Servers – representative
- BL Media Processing – representative
- CTO representative

In actual assignments, there is not always a one-to-one correspondence between roles and individuals: one individual may serve more than one role. For a list of current assignments, see the SPB website.

6.2.3   Relation to OSRP and CMM

Using the terminology of the CMM, the SPB is the organizational element that creates the written organizational policies that guide software development activities within the Nextopia Digital Platform Group. (In CMM, these policies are normally called out in the "Commitment To Perform" elements of each KPA at each CMM Level).

The following points position the role of the Software Program Board in relation to the [Company] Semiconductors Official System Realization Process (OSRP) and the concepts of Capability Maturity Management:

- *The Nextopia Platform Group consists of all the skills needed to develop a complete platform, meaning IC, Software, and associated Boards (what the OSRP calls the "application").*

- *The Nextopia Platform Group has a "SW Program Manager" responsible for complete platform software projects. In CMM terminology, this position is called the "Project Manager".*

- *The **Authority** of the Software Program Board is over all software development resources within the Nextopia Platform Group organization. This authority is exercised through control of the Project Portfolio, budget priorities and "ways of working". The SPB also has authority to negotiate software matters with other [Company] Semiconductors groups on behalf of the NPG-SW.*

6.2.4   Subordinate Boards

To carry out its chartered responsibilities, the Software Program Board has established subordinate Boards to carry out specific mandates. The subordinate boards may be visualized as follows:
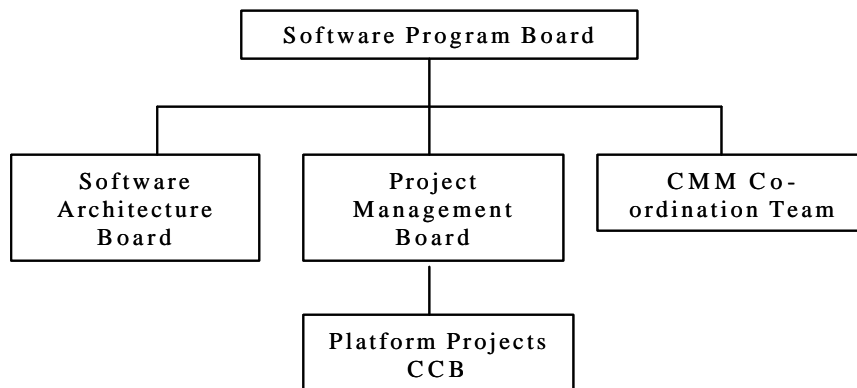

Figure 9: Software Program Board Organization

The subordinate boards are described in detail in the following pages.

6.3   Software Architecture Board (SWAB)

The Software Architecture Board addresses future and present issues of hardware-software integration, compatibility within and among systems and subsystems, and the balance of ambition with reality in road-mapping future product plans. It is chartered by, and reports to, the SPB.

6.3.1   Responsibilities

The key responsibilities of the Software Architecture Board are as follows:

- The scope of the platform software (what is "in" and "out" in a given generation).
- The subsystem architecture and the internal interfaces among subsystems.
- The external interfaces (mainly Public API's)
- Roadmaps for future hardware-software implementations, including the transition from one product generation to the next.
- Ongoing reviews and published (on web site) reviews and status reports addressing items like OS+ Strategy, DVP2 API's, and major new functions.

6.3.2   Representation

The roles to be represented on the SWAB are:

- BU Software Architect
- Nextopia Platform Software Architect (Chair)
- Domain Lead – for each domain
- At least one architect from each location
- Project Architect – each current project
- Division Process Improvement – representative

For a list of current individual assignments to the SWAB, see the SWAB website.

6.4   Project Management Board

The PMB is responsible for the operational control of all digital video platform projects. It is chartered by, and reports to, the SPB.

6.4.1   PMB Responsibilities

In order to maintain control over software project development, the PMB has the following responsibilities over all software projects undertaken within the Nextopia Platform Group:

- Manage project milestones (as defined in OSRP).
- Direct and monitor the progress of the projects, including escalation of relevant (mostly multi-site) issues to the SPB.
- Accept input from customer representatives, as appropriate.
- Supervise change management through the projects Change Control Board.
- Maintain project archives (documents and source code).
- Supervise maintenance of software products through patches and Service Packs.

6.4.2   PMB Representation

The following areas are represented on the Project Management Board:

- Platform Software Program Manager (Chair)
- NPG-SW Development Manager
- SW Development Manager – for each Location
- Customer Representatives
- Project Manager – for each current project
- Project Leads as agreed
- Integration & Verification Manager/Leader
- Nextopia Support Team – Manager

To learn the current assignments of individuals to the PMB, please consult the PMB area of the platform intranet site.

6.5 CMM Coordination Team (CCT)

The CCT is responsible for Software Process Improvement (SPI) –- also known as Performance Improvement (PI) – activities for the software organization, aimed at increasing maturity as defined in the Carnegie-Mellon Capability Maturity Model (CMM). In effect, the CTT is the "owner" of the organization's quality system.

6.5.1 OSRP

[The Company] Quality System is based on the Official System Realization Process (OSRP), which traces back to the [Company] Business Creation Process (BCP). All organizations should use the OSRP as the basic guidelines for product development.

The ReUse Technology Group (RTG), which is part of the [Company] Chief Technology Office (CTO) organization, has created an implementation of the OSRP for software, which includes a structured series of Handbooks, process templates, and implementation guides.

The NPG software organization has elected to use the ReUse Technology Group (RTG) instantiation of the OSRP for software as the software development platform quality system.

6.5.2 CMM

The software platform also uses the CMM as a framework for process improvement. The RTG system traces back to the CMM in general, but leaves a few gaps. To this extent, the Software Platform organization will "fill in " those gaps when necessary.

Based on this decision, the following policies are in force for the Software Platform Organization:

1. All elements of the software organization are to follow the guidelines on the Processes (CCT) web site. These use the RTG Quality System approach as the default guidance.

2. The CCT utilizes the RTG as much as possible when creating and deploying processes for DVP platform software development.

3. Major projects will utilize the OSRP milestone and gate terminology.

6.5.3 CCT Responsibilities

CCT responsibilities include the following tasks:

- Set quantified, achievable goals for improving software performance and process improvement.

- Select or develop standards for measuring performance improvements.

- Develop or select, and then deploy, processes and templates for all aspects of software development.

- Monitor the implementation of software processes, and evaluate results in terms of (a) improvement implementation of established standards, and (b) improving standards to reflect practical conditions.

- Publicize the importance of performance and process improvement.

- Inform developers of the availability of tools and templates (especially via the website).

- Recognize significant achievements of particular teams or projects in achieving CMM goals.

6.5.4   CCT Membership

The roles to be represented on the CCT are as follows:

- NPG-SW Development Manager (Chair)
- General Manager and/or SW Development Manager – all Locations
- SPI Representative – all Locations
- Quality Manager – all Locations

To view current assignments, see the CCT area of the platform software intranet site.

6.5.5   Relation of the CCT to CMM Terms

The following statements relate the activities of the CCT to the concepts of CMM:

Software Process Development and Improvement

1. *The CMM Coordination Team (CCT) has the responsibility associated with the "Software Engineering Process Group" (SEPG) in the CMM. The CCT has the organizational responsibility for software process activities.*

2. *The CCT is responsible for creating and maintaining the organization's Software Process Assets.*

3. *The CCT is responsible for organization-level software process activities and coordinating these activities with projects and sites.*

4. *The CCT will periodically evaluate and, if necessary, update the processes used by projects*

5. *The CCT will facilitate tailoring the standard processes to individual projects and sites.*

6. *The CCT will ensure that useful process information will be shared between projects and sites.*

Type of Work Products Created by the CCT:

1. *The CCT will define a standard software process for the platform organization.*

2. *The CCT will define how projects tailor the standard software process.*

3. *The CCT will define how the organization's process assets are stored, maintained, and made available to platform personnel.*

4. *The CCT will define how information (feedback) from running projects is used to refine the standard software process.*

6.6 Project Change Control Boards

In NPG-SW, each project or related group of projects within a "generation" or major release has its own CCB, which resolves problems within the project or release. Problems and change requests that cannot be decided within the project CCB or affect the platform as a whole are escalated to the SPB.

6.6.1 Change Control Database

A key element of the CCB activity is the database used to record and track change requests and problem reports. The tool used for this purpose is "Change Synergy" in combination with "Continuus," which resides on servers in Briarcliff and Sunnyvale. The system supports separate PR/CR databases for each project, plus a master database for platform-wide issues. An identical set of records is maintained at both locations. User can access the CCB database via [URL].

6.6.2 Responsibilities

The key responsibilities of each project's CCB are:

- Accept requests for changes (CRs) or problem fixes (PRs) to software after the OSRP "PIA" milestone has been approved.
- Track all change requests through a database, which preserves information about who submitted the request when, how the impact was evaluated, and what action was taken.
- Make all change requests visible to all NPG-SW developers in all locations, and allow qualified engineers to add information to the record for each proposed change.
- On a regular basis (usually weekly), evaluate each request, and take an appropriate action, such as (a) reject without further ado, (b) explain why the problem does not require a software change, (c) assign the CR/PR for evaluation, including the impact of one or more change solutions, (d) evaluate the results of an investigation, or (e) accept the CR/PR with an estimate of the effort involved in implementation.
- Refer appropriate PRs and CRs to the Hardware Group or the Board Design Group.
- Escalate unresolved software issues to the PMB.

6.6.3 Project CCB Representation

Each project's CCB comprises a core team, who are present at all CCB meetings throughout the project, and an extended team, who are invited as needed. The core team consists of:

- Project Manager
- Project/Sub-Project Lead(s)
- Nextopia Support Team (NeST) Representative
- Secretary

The extended team includes the following roles

- Project Architect (especially in beginning stages)
- Customer representative (from MSTs)
- Integration & Verification Lead (especially in later stages)
- Release/Build manager in each location
- Guest "experts" as required
- SW Quality Manager

The PM appoints the chair of the CCB – typically the Project Lead.

For individuals assigned to project CCBs, consult the projects' websites.

7 Software Development Policies

The policies and procedures governing software development in the Nextopia Platform Group may be found on the NPG-SW web site, under "SW Processes." Some of the processes are taken over from other sources, such as OSRP, the RTG group, and processes developed at one of the Group locations. As a young organization, the Nextopia Platform Group is in the process of identifying these processes, adapting them to our purposes, or creating new processes when needed. The goal of this improvement activity is to enable the entire NPG-SW organization to become certified as "CMM Level 2." Instructions on where to locate the currently approved policy or process may be found on the web site.

The definition of NPG-SW policies and processes is the responsibility of the CCT, under the supervision of the SPB. The implementation of the approved policies is the task of the CCT team and the Development Managers at each site. These policies are to be followed unless a project or activity receives a waiver from the SPB.

The following sections list the key areas where written policies and processes exist, or should exist, along with a few key points associated with each area.

7.1 Requirements Management

The CCT will develop and deploy a Requirements Management process that implements the following elements of the Requirements Management Policy:

- A requirements specification is required for any project. This may be an FRS (Functional Requirements Specification) for the entire product, or an SRS (Software Requirements Specification) for the software component.

- When a higher-level requirements document exists, the SRS may refer to the controlling document(s) but must specify all identified software requirements of the subsystem.

- Once documented, requirements must be approved, at a level defined in the RM process. At a minimum, the process will require review by the Overall Project Manager (if one exists), the Software Project Manager, the Software Engineering Group tasked with implementing the requirements, the Platform I&V Team, the SCM team, and SQA engineers, and the Documentation and Release team.

- The process will indicate the link between the requirements document and software planning, tracking, change control, testing, and design activities to ensure requirements and all software work products are kept consistent when changes are processed.

7.2 Project Planning

The CCT will develop and deploy software Project Planning process that implements the following elements of the Software Project Planning Policy:

- Documented software requirements are to form the basis for planning the software project.

- Resource commitments arising from the Plan are negotiated and agreed by (at a minimum) the Program Manager, the Development Manager, the Project Manager or Leader, and managers or leaders of other affected groups.

- Planning will include activities and estimates for Quality Assurance, Configuration Management, Integration & Verification, and User Documentation.

- All affected groups shall review all planning work products.

- Senior management [the SPB] shall review all software project commitments.

7.3   Project Tracking and Oversight.

The CCT will develop and deploy a Software Project Tracking and Oversight Process that implements the following elements of the Software Project Tracking and Oversight Policy:

- Documented project plans shall be used as the basis for tracking the software project.

- The Program Manager shall be kept informed of the software project's status and issues.

- The tracking process shall have a means of indicating when the plan is not being achieved, and how and when actions will be taken in response to the deviation between plan and performance.

- Changes to software commitments shall be documented and agreed by all affected groups.

- Senior management reviews all commitment changes.

7.4   Subcontractor Management

Except for documentation specialists (who don't really count), the software organization does not subcontract software development work at this time.

7.5   Quality Assurance

The CCT will develop and deploy a Software Quality Assurance process that implements the following elements of the Software Quality Assurance Policy:

- All projects shall include an SQA function.

- The SQA group has a reporting channel to senior management independent of the Project Manager, the Project or Team Leader, and other software related groups.

- Senior management shall periodically review SQA activities and results.

7.6   Configuration Management

The CCT deploys a Software Configuration Management process that implements the following elements of the Software Configuration Management Policy:

- Each project shall have an explicitly defined SCM responsibility.

- SCM shall be implemented throughout each project's entire life cycle.

- SCM shall be applied to specific products and deliverables, such as defined software releases, internal deliverables, tools, etc., which are identified in the project's SCM plan.

- Each project shall establish an SCM repository.

- SCM activities shall be audited on a periodic basis.

Note that at this writing, a global SCM plan for the platform organization is under development.

7.7   Training Programs

Training is delegated to the software Development Managers at each location, who will work with the teams and competencies assigned to their sites by the SPB to determine the training needed.

7.8 "Software Product Engineering"

In CMM terms, software engineering tasks are performed by what CMM calls the "Software Engineering Group", and what the platform identifies as "subsystem engineers allocated to a project". Software product engineering, then, involves the engineering tasks to build and maintain software using a project's defined process, and includes activities such as detailed design, coding/implementation, unit testing, and documentation.

7.9 Peer Reviews

The CCT will define a process for conducting Peer Reviews within the software organization. The process will address the following issues:

- Process defines an ideal or "generic" list of software work products that normally should undergo a formal peer review.

- The projects shall tailor this list and create their own list of work products that should undergo peer review.

- The projects shall have access to personnel trained in leading peer reviews.

- The results of peer reviews are not used by management in performance reviews.

7.10 Software Product Quality

This section refers not to the process oversight associated with SQA activities, but measures on the intrinsic quality of the software products being produced.

- The CCT will create a process that defines the basic quality measures each project should collect, and how to collect them.

- The CCT will provide the tools necessary to collect the stipulated metrics.

- The CCT will create a process that defines how the basic quality measures are stored, displayed, and used to measure product quality.

7.11 Documentation

The CCT will develop and deploy a Document Management System governing both internal and end-customer user documentation for released software products. The DMS shall include organization-wide conventions regarding:

- Version numbering of documentation.

- Documentation status, such as Draft, Proposed, Approved, etc.

- Required information on all documents (title, author, date, revision history, etc.)

- Nomenclature for the NPG-SW organization, the platform, and components (consistent with the RTG file-naming requirements)

- File-naming conventions.

- Publication (via intranet) of draft, approved, and in-process documentation.

- Tools and formats (Word, Framemaker, PDF, HTML, etc.) used for documentation.

8   Appendices

Below please find the following appendices:

- Reference
- CMM Terminology & Definitions
- Glossary & Definitions
- Revision History

8.1   References

[1]   [Company] , *Overall System Realization Process*, Version 2.1 (4 April 2002).

[2]   Software Engineering Institute, Carnegie-Mellon University (Pittsburgh, PA), "Capability Maturity Model for Software," http://www.sei.cmu.edu/cmm/

[3]   [name] & [name], MoReUse 1.1: Levels 1, 2, 3 Standards Book, [Company] MoReUse Technology Group, Version 2.0 (2002-03-28).

8.2   CMM Terminology & Definitions

The Nextopia platform software organization has adopted the CMM framework as part of defining the "ways of working" within the platform. This section presents the CMM terms and maps them to the terms used in the Nextopia platform software organization.

Term	Software Platform Organization Instantiation
First Line Software Manager	In [Company], this term would refer to SW Development Manager or Functional Manager at each location.
Location	The term "location" is used when addressing items that are specific to a physical location, such as Briarcliff, Sunnyvale, or Eindhoven.
Organization	Refers to the Nextopia Platform software organization. If the term is used to describe a site, the distinction will be called out in the text.
Policy Statement	This handbook contains the software platform organizational policy statements for software development activities.
Project	A defined set of work with known constraints, schedule, budget and deliverables. In CMM terms, an activity under the control of the Software Program Board, staffed by a Project Manager, development engineers selected for their domain expertise, and designated resources for SQA, SCM, User Documentation, Release Management, and Customer Support.
Project Manager	Person responsible for the definition, planning, staffing, day-to-day progress, and timely completion of a project.
Senior Manager	A member of the Software Program Board, or a location's Functional Manager. Depending on the situation may also include Business Unit, Business Line, and Product Division Management.
Software Engineering Group	The software personnel working on a project – the "project team."
Software Engineering Staff	The engineers on the teams doing the development work.

Term	Software Platform Organization Instantiation
Software Process Engineering Group (SEPG)	The "SEPG" in the NPG-SW organization is the CMM Coordination Team (CCT), which guides process and performance improvement activities across the platform.
Software Product	The complete set, or any individual item within the set, of computer programs, procedures, and documentation and data designated for delivery; a subset of the general term "Software Work Product".
Software Task Leader	Sub-Project Lead.
Software Work Product	Any item created during the software project related to defining, implementing, testing, and maintaining deliverables.
Software-Related Groups	More specific than "staff," this term describes groups such as SCM, SQA, and the documentation and release team(s).
SQA Group	In our organization, this is the Software Quality Assurance people assigned to a project.
Staff	People who work here.
System Test Group	In the Nextopia software organization, this is the Integration and Verification (I&V) team located at Briarcliff.
Systems Engineers Group	This group is at a higher level than just software, and so is not in the scope of the Software Platform organization. At this time there is no group in the BU or PD that executes this function as described in CMM. In CMM, this would be the group that defines the system requirements and allocates the requirements to hardware, software, etc.

8.3 Glossary & Definitions

Term	Software Platform Organization Instantiation
BCP	Business Creation Process
BL	Business Line
BU	Business Unit
CCB	Change Control Board
CCT	CMM Coordination Team
CM	Configuration Management
CMM	Capability Maturity Model
DCP	Digital Consumer Platform
DS	Digital Systems
DVP	Digital Video Platform (Nextopia)
EHV	Eindhoven, the Netherlands
IC	Intergroup Coordination; Integrated Circuit
MT	Management Team
NDK	Nextopia Developers Kit
NPG	Nextopia Platform Group
NPG-SW	Nextopia Platform Group Software organization
OSRP	Official System Realisation Process
PI	Platform Infrastructure (section)
PL	Project Leader
PM	Project Management
PMB	Project Management Board
PMP	Project Management Plan
Nextopia	Company's brand name for platform
NeST	Nextopia Support Team
RM	Requirements Management
SC	Speech and Communication (section)
SCM	SW Configuration Management
SoC	System on a Chip
SPB	Software Program Board
SPL	Sub-Project Leader
SQA	Software Quality Assurance
SSG	Software Services Group
SW	Software
SWAB	Software Architecture Board

8.4 Revision History

The following is a summary of the document's history:

Revision History				
Date	**Who**	**Vers**	**Status**	**Changes**
5/18/02	[name]	0.01	Draft	Creation, based on SSG handbook.
5/29/02	J. Hoekema	0.02	Draft	Edited for usage, terms, formatting; added NPG chart.
6/11/02	J. Hoekema	0.041	Draft	Added more description of functional roles, moved CMM correlations to appendix.
6/13/02	J. Hoekema	0.5	Draft	Minor corrections for circulation draft from [name] & [name]
7/11/02	J. Hoekema	0.6	Draft	Incorporated substantial comments from [name], [name], [name], [name], [name] & [name] • Added subordinate boards • Reduced, moved, or de-emphasized CMM-unique content. • Quality material to CCT section. • Job defs outside of board roles.
7/17/02	J Hoekema	0.7	Draft	Incorporated detailed comments from [name], [name], [name], [name], [name] & [name].
2 Aug 2002	J. Hoekema	0.8	Draft	Incorporated (a) comments from [name], esp. on domains vs. functional management, and (b) input on v0.6 from [name], [name], and [name].
5 Aug 2002	J. Hoekema	0.81	Draft	Minor updates from [name].
6 Aug 2002	J. Hoekema	0.82	Draft	Cleanup for general review.
20 Aug 02	J. Hoekema	0.91	Proposed	Moved most individual assignments to separate Attachment (& web pages).
30 Aug 02	J. Hoekema	0.92	Proposed	Incorporated comments and corrections from [name], [name], [name], [name], [name] & [name].
24 Sept 02	J. Hoekema	0.99	Proposed	Corrections from [name], [name]. Removed Attachment (transfer to intranet site).
2 Oct 02	J. Hoekema	0.99b	Proposed	Final updates on domains from [name] & [name].
3 Oct 02	J. Hoekema	1.00	Approved	Final cleanup. SPB approved.
31 Mar 03	J. Hoekema	1.1	Rogue	Names changed to conceal actual company and names.