

Bachelor's Thesis

Electronics

2011

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# MOBILE PHONE CUSTOMIZATION WORK DEVELOPMENT AND IMPROVEMENT



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This thesis is a work study of the process where the Marketing Product Manager (MPM) customizes mobile phones into variants after specifications of different countries and operators. The purpose was to map different working methods and pain points occurring in the MPM's daily work. Variant management is an important part of the Nokia portfolio and provide an excellent competitive advantage, since other phone manufactures do not have similar services available for their customers or at least not in the same scale as Nokia is able to customize devices. As a result, MPMs have the key role because they act as the customer interface and close co-operation with customer.

Information was collected mainly through own and colleagues experience but also using a questionnaire which was drawn up for the European Local Sales Unit MPMs and for the Operator Channel's (OC) MPMs and the results were collected using a survey, which was deployed on the company's intranet pages.

The results discussed in this thesis represent a good understanding of problem points of the MPM work. On the basis of the findings, it was possible to introduce improvements to the overall process as well as a number of smaller changes. The aim of the proposal was to eliminate the most serious problems, to adapt the process, to make tools meet the current requirements and to make the problem handling more efficient. Communication was identified as a major bottleneck and therefore special attention should be paid to it in the future.

### KEYWORDS:

processes, communication, time management, training

Jarkko Erkkilä

## MATKAPUHELIMEN KUSTOMOINTITYÖN KEHITTÄMINEN JA PARANTAMINEN

Opinnäytetyön tarkoituksena oli selvittää Marketing Product Managerin (MPM) työhön liittyviä ongelmakohtia ja kehittää työtapoja sekä prosesseja toimivammiksi. Parannusehdotusten tarkoituksena on poistaa suurimmat ongelmakohdat, mukauttaa prosesseja, työkaluja ja ongelmatilanteita. Työ on rajattu käsittämään ainoastaan MPM:n työtehtäviä varianttityön kannalta katsoen. Varianttityö tarkoittaa puhelimen kustomointia asiakkaille heidän tarpeitaan vastaavaksi. Kysely suoritettiin Euroopassa sijaitsevien myyntiyhtiöiden henkilöille. Tieto tutkimusta varten kerättiin kyselylomakkeella yhtiön intranetsivustolla.

Varianttityö on tärkeä osa Nokian tuotevalikoimasuunnittelua. Se on myös osaltaan loistava kilpailuetu, koska kyllä kyllä kyllä matkapuhelinvalmistajilla ei ole vastaavaa palvelua samassa mittakaavassa tarjolla, kuin millä Nokia pystyy kustomointeja toteuttamaan. Tästä syystä MPM:t ovat avainasemassa, koska he toimivat asiakasrajapinnassa ja tiiviissä yhteistyössä asiakkaiden kanssa.

Opinnäytetyön lopputuloksena saatiin hyvä käsitys MPM:n työn ongelmakohdista. Kustomointityökalujen suuri määrä ja kommunikointi eri sidosryhmien kanssa todettiin suurimmaksi pullonkaulaksi. Tulosten pohjalta kriittisimpiin osa-alueisiin tehdään parannusehdotuksia ja pyritään mukauttamaan prosessit ja työkalut paremmin toimiviksi. Kustomointityökaluja on kehitetty paljon työn kuluessa, mutta siirtymävaiheen aika ne eivät ole vielä vähentäneet työkalujen määrää. Uusien työkalujen mukanaan tuomat paranukset ovat vielä tutkimatta, joten työtä voisi jatkaa tästä näkökulmasta.

### ASIASANAT:

prosessit, kommunikointi, ajankäytön hallinta, koulutus

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## LIST OF ABBREVIATIONS

AVR	Additional Variant Request
BOM	Bill of Materials
Bookmark	Uniform resource locator (URL) stored in the user's own storage list where information can be accessed
CARE	Customer Care
CG	Customization Guidelines
Content library	A web-based tool for content delivery for Symbian devices
CTR	Customer Transceiver
Cute	S40 Customization Tool
Code Matrix	Web page on the Intranet for consumer package content
DCU	Device Customization Team
gMES	Global Manufacturing Execution system
GTM Program	Go To Market Program
Jig	Flashing adapter
LSU	Local Sales Unit
MDC	Mobile Device Configurator
MPM	Marketing Product Managers
NDT	Nokia Default Transceiver
NSU	Nokia Software Update
OC	Operator Cannels

ODV	Order Driven Variant
PA Tool	Product Approval Tool
PRx release	Product Release
PVL	Product Variant Leader
RC	Running change proposal
S40	Series 40 platform
SCPS	SIM-Card Provisioning Settings
SP- only	Sales Package proposal
SU	Sales Units
SWU	Software Update
USB	Universal Serial Bus
Voucher	A printed card which is worth a certain monetary value and which may be spent only for specific reasons or on specific goods

# 1 INTRODUCTION

This work has been done for Nokia Marketing & Communication business unit. In the thesis are the following organizations involved: The product management which is responsible for all product management activities on the market, before and after a new launch and also during the whole product lifecycle. This includes SW (software) release management, variant, prototypes, overall product management and markets insight. The Product Management teams in Sales Units (SU), Local Sales Unit (LSU) and the Operator Channels (OC) co-operate closely together with Product Programs, GTM Programs, Device Customization Unit (DCU) and other remarkable stakeholders to ensure relevant solutions planning and execution in program mode. This thesis is focusing on the MPM's basic tasks and the problems detected in MPM's way of working.

Any similar theses could not be found in the Theseus database.

The goal was to improve and develop the MPM's working conditions like tools, information availability, responsibilities, training and co-operation between customers, MPMs and organization internal teams using the questionnaire results as a reference.

This thesis is related only to variant creation. The aim was to map working methods and pain points in the MPM's daily work. The questionnaire has indicated for European Local Sales Units MPMs and Operator Channel MPMs and the results are collected using a MPM survey, which has been published on the company's intranet pages

This thesis is divided into five main sections. The topics of discussion include tools, processes, communication between customers and internal teams, time management and internal training.

The author most important part was the planning for the survey and making plans to solve the problems occurred in the customization process.



## 2 MPM'S MANAGEMENT TOOLS

The company uses a number of different tools which have to be managed by the MPMs. Furthermore, the existing tools are continuously developed and new tools are published. Training for new tools is available continuously, but there is usually also unnecessary information and repetition, which leads to a situation where many of MPMs with a work experience of several years will not participate in the training sessions provided. A lot of documentation can be found on Nokia's intranet pages, but it is challenging to find the correct information. Insufficient communication has been identified as a major problem, which causes delay in variant delivery.

A variant creation is quite challenging because of the numerous tools that the MPM's should be able to handle. Tools are being upgraded continuously and the new tools are frequently published. The problem is that new tools don't typically replace old ones completely, but instead increases the range of tools and leads to a situation where some device customizations are handled with several different tools. This is quite confusing from the MPM's point of view and it also causes a lot of misunderstanding in the variant creation processes.

Tool testing is typically a very critical phase during the new tool development. Different pilot phases are organized into in a particular sales unit but unfortunately new tools are often taken into organizational use prematurely.

When a new tool is developed the system test phase is important to perform. A system test checks if the customized product meets the specified requirements. The system suits its purpose only when all the system functions are implemented and all the components collaborate correctly. The system test determines whether all the components and the system itself is working as expected [2]. Different system test pilot are used in the variant creation processes for this purpose.

Testing has the following key objectives:

- to ensure before any changes that all the required functions are included in the new system test
  - to ensure that the system functions perform correctly
  - to ensure that the system performs with all the related options enabled
  - to ensure that the system meets all the quality and/or standard requirements.
- [2]

The purpose of the commissioning planning and a preparation phase is to start all the required preparation activities for publishing a new system or tool to end users and for the production. Ambition is required to ensure that commissioning is running smoothly and that the project is on schedule.

## 2.1 S40 customization tool Cute

Cute S40 Emulator is a series 40 (S40) platform tool which offers a possibility to configure S40 mobile phone software with a help of a phone emulator. Series 40 is world's most widely used mobile platform with hundreds of millions devices in the market. The platform is implemented using a Nokia operating system and offers the developers the opportunity to create applications using Java ME API's and Adobe Flash Lite. The products built upon Series 40 reach a wide range of price points, and Java ME is a perfect complement to reach this high volume platform. [3]

A user can view the actual software variant on an emulated phone or on a real phone as changes are being made to the configuration. It is possible to flash the real phones with the Cute which is presented in Figure 1. as well.

Key benefits of the emulator can be summarized as follows:

- It is easy to create S40 software variants.
- Variant creation process its streamlined, avoiding unnecessary steps.
- Variant creation lead time is reduced.
- Error correction is reduced [4].

Most respondents to the questionnaire reported that they are familiar with using the Cute and that they know where to find the correct instructions for how to work with the tool. Some respondents considered the Cute ineffective and not very user-friendly. Difficulties are faced when choosing the correct Nokia Default Transceiver code (NDT) and in the color update processes. Sometimes there seem to be alternatives for how to handle the NDT codes in different teams. For example, the Device Customization Unit (DCU) and Sales Package (SP) team are asking for a different code even though it should be exactly the same one. This increases the manual workload and the lead time. Code Matrix is mentioned as a location where the correct NDT can be found easily.

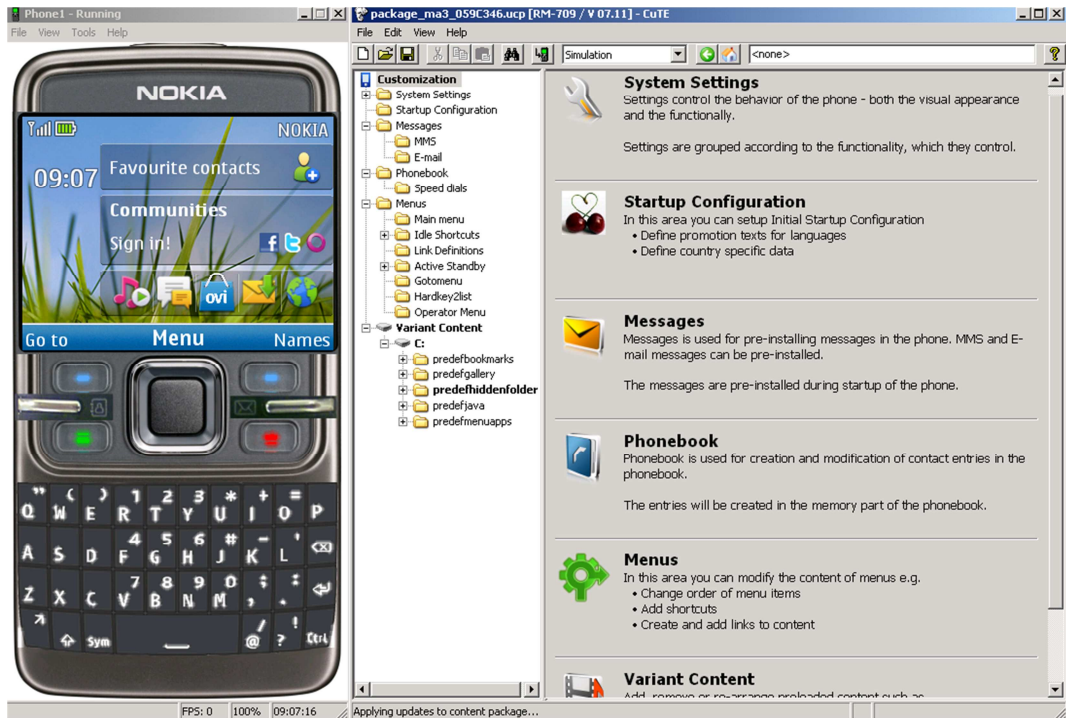


Figure 1. A screen capture of the Cute tool

The color update process which means that the menus are modified to be in harmony with the color of the phone covers has become more complex along with the Cute tool. Previously color updates were handled via the mobile device configurator (MDC) and it was a very simple and fast way to make a customization. Today, the Cute package needs to be downloaded from MDC each time a new color variant is created instead of re-using the already existing package. The Cute package of main color's is used, but it must be updated with the correct NDT code which is carried out by downloading Cute from the MDC. Users have requested a more automated tool for the color update processing. When a new product is released, all the colors are not available simultaneously and this can be confusing for the MPMs. One potential solution could be to develop only one software variant and the same package could be used with all the phone colors. Figure 2. shows how familiar the MPM's are with using the Cute tool. It is to be noted that the blue section in the pie chart does not mean that 20 % of the MPMs do not know how to use the tool; they only indicated some problems using it or considered that the tool is impractical.

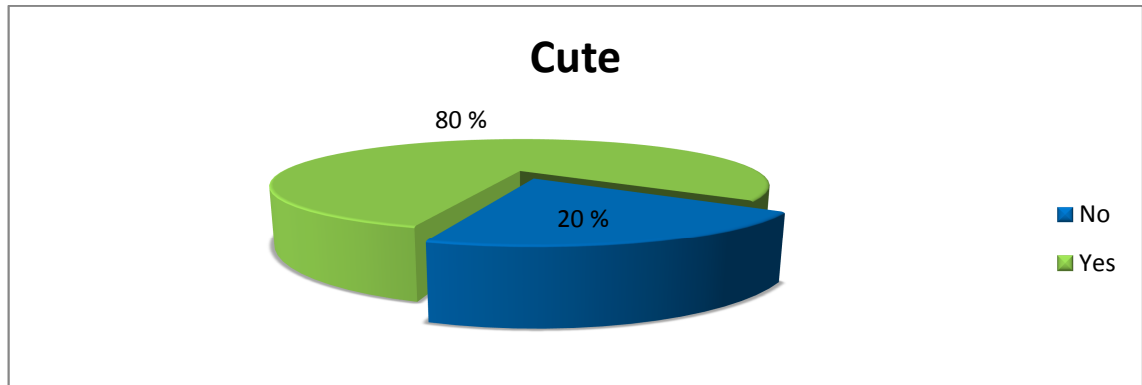


Figure 2. How familiar the MPMs are with using Cute

## 2.2 Product Approval Tool (PA Tool)

The PA Tool handles the information of customer decisions. Customers have given approvals for a products software version to be used in a specific mobile phone. The information is usually automatically agreed to and the customer is normally allowing the use of the latest software version of a product. This is called “Auto Approval” in the tool options and in the processes. Auto Approval is the default value in most cases. This tool is in use in all regions and factories at the moment [4].

The PA Tool is a well-known to the MPM's, but a lot of manual effort seems to be taken to synchronize the tool and every single variant. The Auto Approval is regarded as a good feature and the MPMs are pleased with its reintroduction after a few years' break. Ambiguity has given rise a question of who is and who is not the “auto approval” customer.

## 2.3 Mobile Device Configurator (MDC)

The MDC is used for creating variant proposals for the mobile device products and services. It provides visibility to the product customization process, as well as improves quality and speed in the creation of the customized mobile phones. The MDC enables visibility by tracking the status of a complete variant until its factory implementation. Figure 3. shows the MDC home page and a variant process view.

The screenshot displays the MDC interface for a variant proposal item. The top navigation bar includes 'Welcome, Jarkko Erkkilä', 'MDC', and 'Support'. The main content area shows the 'Variant Proposal Item VAR159364: Variant Proposal (00 Draft) E7-00 RM-626 Country Variant United Kingdom GB Blue Online V1'. The 'State Change History' section shows a sequence of actions: 'Submit' (03/07/2011 09:59:12 AM by Jarkko Erkkilä), 'VP Auto-Promote to 01' (03/07/2011 01:37:24 PM by Jarkko Erkkilä), '01 Specification Completed' (03/07/2011 01:37:24 PM by Jarkko Erkkilä), 'VP Auto-Demote to 00' (03/08/2011 06:51:45 AM by Vaman Divya), and '00 Draft' (03/08/2011 06:51:45 AM by Jarkko Erkkilä). The 'Details' section lists various attributes such as Item Id, Name, Approval Code, Variant Name Free Text, Model, Platform, Type Designation, Based on Sales Package, and New Sales Package.

Figure 3. Overview of the MDC

The MDC is composed of two synchronized applications:

- A Configurator for customizable items and features, which is used in the transceivers and the customer packages creation.
- A workflow tool for status tracing, which enables Nokia to manage the variant proposal creation process. [4]

At the moment MDC release 7 is in use. The MDC is a comprehensive opportunity for the creation of various variants:

- New proposal
- Color variant
- Running change proposal (RC)
- Sales package proposal (SP- only)
- Software update proposal (SWU)
- Memory card / Mass memory proposal.

Figure 4. presents the main MDC statuses and the teams that are responsible for the specific steps.

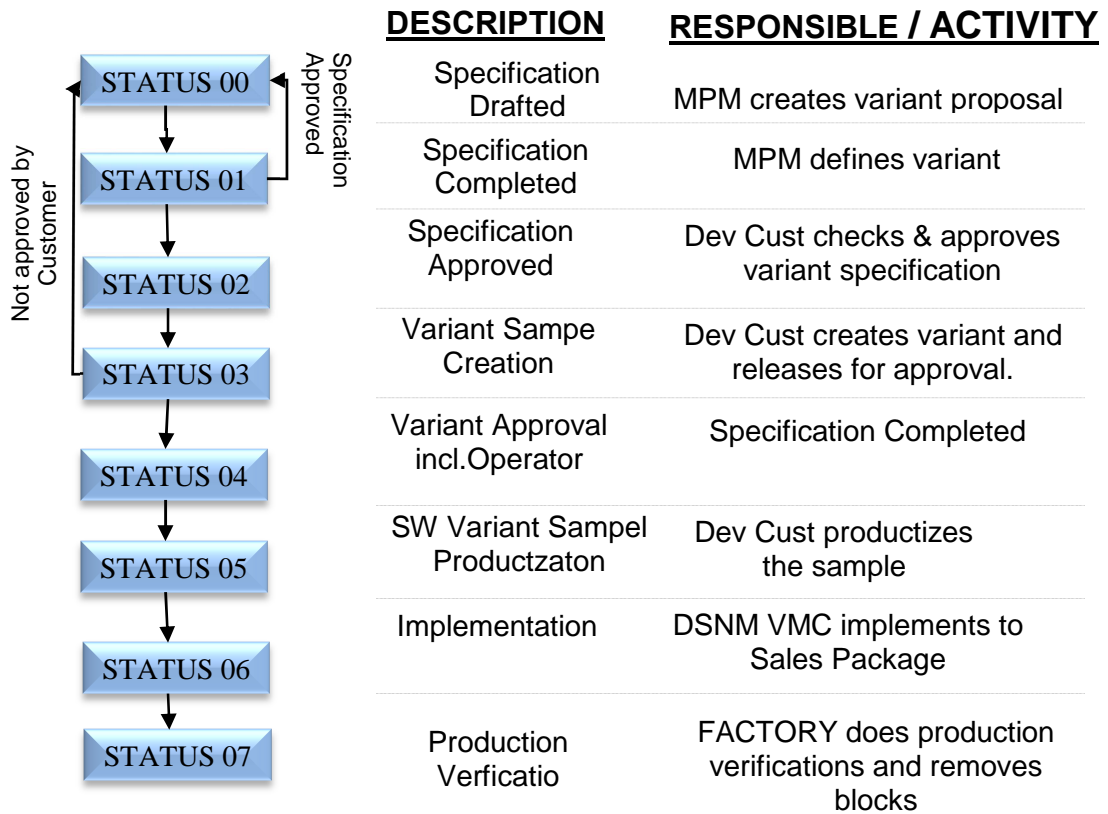


Figure 4. MDC process status steps [4]

### 2.3.1 MDC workflow

The MDC has two different models in use, a simple model and a full model. The Simple model is now obsolete and is no longer in use. Nonetheless, variants in the tool still exist which have been prepared by using the simple model, and updating may sometimes be required. All the customizations were made on separate Excel templates and the templates were uploaded to the MDC. Only the sales package content was added via the MDC.

In a full model, all the customizations are made in the MDC configurator. As all phone models have a specific customization model in its configurator, it depends on the model what kinds of customizations are available. In addition, the S40 phones have a different process. The Cute application can be downloaded from the configurator and all the software customizations are made via the Cute. Only the sales package content and the mechanics will be added to the MDC. Cute will create a certain zip file which will be

uploaded to the MDC. When the content has been approved in both cases, the new variant will be delivered to sample creation.

The MDC is a well-known application for MPM's. All respondents to the questionnaire indicated that they are familiar with the tool. However, some features did not convince the users. The continually added values should be automated. This is very time consuming, and the proposal creation would be much faster if the customer information, for example, were automated. The tool is considered to be rather complex, slow and not very efficient. Quite a few different bugs have been detected. Nevertheless, even release 7 is in use at the moment. In the customization process of S40 products this is uncomfortable, especially when handling the customer configuration settings management. A number of different steps occur when the configuration settings need to be changed. Moreover, the MDC email notification is not working as expected. When a variant reaches a specific status, the tool should immediately send a notification to the responsible person. This seems to be a user settings problem rather than that related to the tool. Furthermore, the MDC support and ticket creation are considered to be slow. It takes too much time to solve the different MDC problems. The MDC support is a global service and employees are changed continuously. Figure 5. presents the different steps within the main status of a variant proposal.

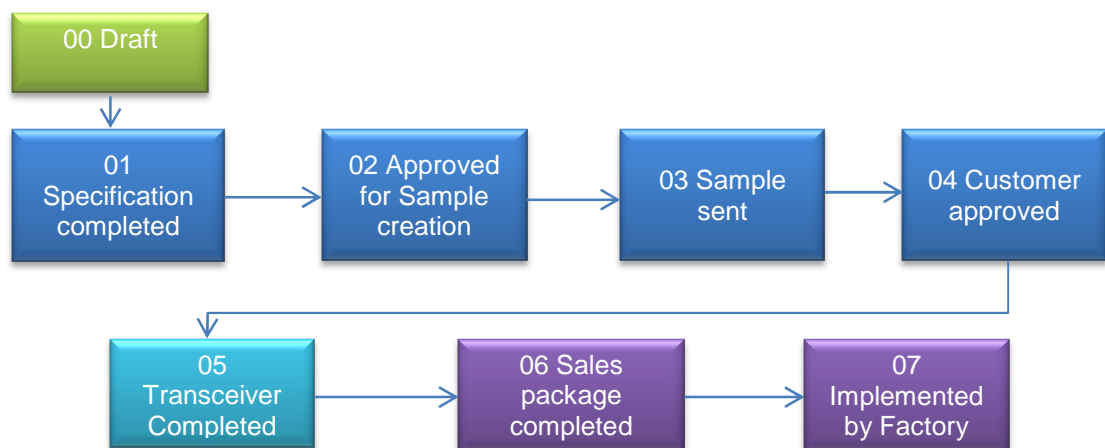


Figure 5. Steps of variant proposal in MDC

### 2.3.2 New proposal

A new proposal is created by the mobile device configurator. At first, an “Approval code” has to be generated using an approval code request tool. All the requested settings are collected from the customer and the defined customizations will be added to proposal using the MDC configurator. Before that, the correct NDT and SP codes need to be selected. Customization can be made for the sales package, software and mechanics, but there are some limitations for the customers. For example, volume is restricted depending on whether we are dealing with a standard or a strategic customer.

The MPM's are familiar with the new proposal creation and most of them know where the MDC instructions are available. Some instructions appear to cause confusion regarding the NDT and SP codes. There seem to be different practices in use, depending on Product Variant Leader (PVL) or variant coordinator, even though it should be highly obvious for all those working with variants. The CG contain all the customization alternatives which are allowed to be used for the particular phone model. The MDC configurator and the CG do not always work together. Some customizations are not available in the configurator, although the CG has specified them. In addition, the CG may not be updated after the new SW release. This causes delays in variant delivery because the AVR needs to be made as well. The AVR process is slow and the lead time will increase, which is an unwanted consequence.

The level of knowhow was included in the survey. Figure 6. shows that 80 % of MPM's are familiar how to use the MDC's new proposal feature. 20% of them have had some kind of problem in the proposal creation or report that the instructions are not clear enough.



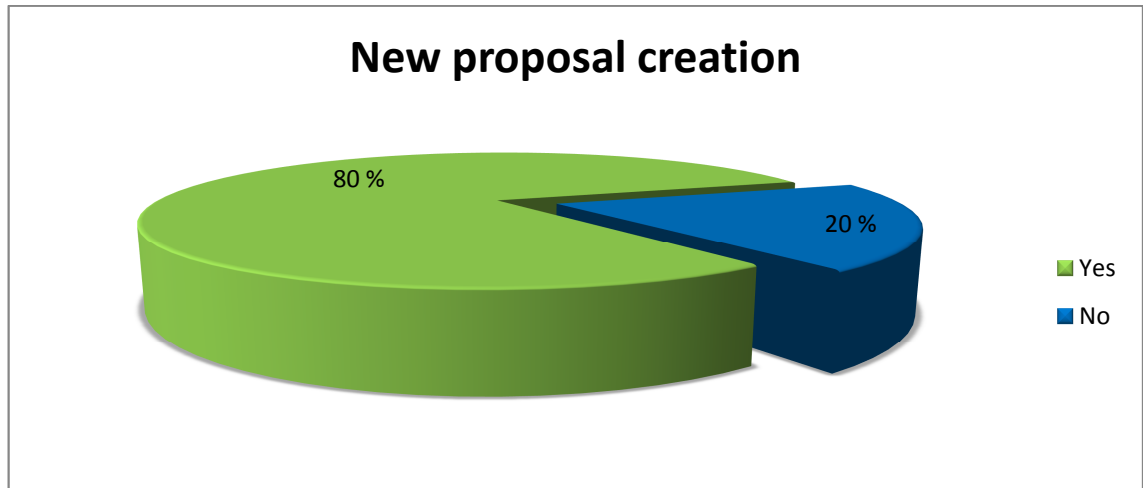


Figure 6. Familiarity of the MPMs with the new proposal creation

### 2.3.3 Color variant proposal

Color variants will be created if a phone model has several colors available. In general, the process is quite simple. The MDC full model feature allows making a copy of the main color, after which all the customization options will be copied into the new color variant. The process is slightly different when working with the Cute variants. The Cute application needs to be downloaded from the MDC whenever a new color variant is created. The MPM's consider the Cute process to be time-consuming and complicated.

The Color variant version management is considered to be complicated. Sometimes a new color will be launched later, and the previous color variants are already created in the MDC. In case the main color version is V2 in the MDC, the new color should immediately be V2 instead of V1. There seems to be an issue as well, when creating V2 for the color that was originally launched as a color variant in the V1 proposal. The V2 version needs to be launched first from the main color, even when the main color is not as urgent as the V2 color variant. At any rate, the main color has to be updated even if it were not needed at all. In a case where local variants are based on global ones, only the global settings are implemented and local customizations need to be done manually, which will increase MPM workload. All this has caused unnecessary demotions in the MDC, and the lead time has become longer.

### 2.3.4 Running change proposal (RC)

A running change proposal is created when it is decided to change a previous variant content. Generally, this process is extremely simple. The MDC creates a copy of the previous variant and only changes the option properties to be implemented with the configurator. The color variant needs to be created from the new RC proposal, so the color one cannot be based on the previous color variant, as can be seen in Figure 7. The Cute variant proposal creation is made as described above.



Figure 7. Incorrectly identified color variant

Most of the MPM's are familiar with RC proposal creation. The difficulty seems to lie in selecting the correct NDT code and SP code or knowing if new transceiver or sales package code is needed. The "Based on Codes" should always be the NDT code, whereas the RC proposal sales package code should be based on the previous proposal new SP code. Sometimes, the requirements for the "Based on Codes" change from one variant team to another, which causes confusion and hampers process understanding. The instructions must be updated to be compatible with the running change process.

### 2.3.5 Software Update (SWU) proposal

The Software update proposal is used when only SW will be upgraded for the newest SW version. Other changes are not allowed after the SWU proposal has been made. A new approval code request is not needed as in the other proposal processes. Information is required on whether a Care/NSU/Fota package is needed or not and, of course, on what the requested version of SW is.

The MPM's regard Auto Approval as a good feature in the SWU process, since it has been disabled previously. This does not mean that SWU proposal will be made automatically; it only means that an operator does not need to approve it again. A

bigger problem is that the SWU is sometimes not enough, since the new Core SW brings with it some changes that are not acceptable to all customers, and a running change proposal is needed. A particularly approved SW version needs to be included in the SWU activity, and it is so impractical that the MPMs cannot launch a SWU proposal before the PRx release has been approved for production. This would prevent the completion of some MDC advance work, and would also indicate the need for a SWU to the variant team for their advance resource planning purposes. According to the MPMs, it should be possible to search SWU variants from the MDC more easily. However, this is likely to be a competence problem since the MDC has comprehensive search options and reporting features.

### 2.3.6 Sales Package proposal (SP)

The sales package customization services are a part of the Nokia customization and logistics services available to Nokia customers. The customization provision enables Nokia to help customers in their pursuit to differentiate their offerings (e.g. seasonal campaigns) as well as to optimize their logistical flows. The current offering covers a wide range of customization elements and processes which are being set up to systematically gather and develop new offering elements to best address the market requirements.

The sales package content is the phase where it is possible to insert the majority of wishes concerning the Bill of Materials (BOM) of the sales package. A sales package variant is created even when only the sales package content is to be changed. The Process proceeds are explained in the new proposal above. No CTR changes are can be made at the same time; in fact, there is no CTR activity in the proposal. A separate leaflet, voucher, sticker, sleeve and, for example, a CD-ROM and DVD, can be included into the Sales Package (SP) content. For the time being, different printed materials can also be handled by the sales unit itself. This process is called "On-Demand printing services", and the sales units can create promotional marketing materials such as stickers and simple leaflets for the production in Nokia's own factories.

From the MPMs' point of view, sales package creation is a quite well-known process. The MDC rel7 has a new feature which blocks SP-only creation, if a new CTR code has been requested. This is considered to be a good characteristic since it will reduce the risk of making mistakes. Confusion is caused by a correct "based on color Sales

Package (SP)” selection, because there seem to be inconsistent practices in different logistics teams and factories. In some cases, a new color will be created from a previously created “based on package” even when there should be “based on codes” for all the available colors. This will happen if new or several colors are published after the sales startup.

### 2.3.7 Memory card and mass memory proposal

In some cases operators may wish to create their own memory card/mass memory content instead of using the vanilla content. The content can be, for example, a selection of different games, music files, videos, or the operator’s own applications. Different country and regional cards may exist as well. The Memory card/mass memory proposals are always created separately and are not included in the transceiver proposal. In this case the MPM needs to create a transceiver proposal to include a memory card or a mass memory in the correct transceiver, even if the transceiver has originally been the vanilla content.

Memory card/mass memory proposals have been made less frequently than the other proposals. A few of the MPM’s have not done any memory card or mass memory proposals at all. Nevertheless, the memory card/mass memory process seems to be well-known and the MPM’s do not have any major problems in the variant creation.

### 2.3.8 Services and licenses

Services and licenses are administered with the MDC. The MDCs have a licenses section where it is possible to define all license and service codes for the variant. Nokia provides a variety of services which are embedded in a device, available for the end user either for downloading to the device, as a stand-alone item, or as a service and license within the sales package. The Local Sales Unit (LSU) MPMs will create MDC variant proposals including the service element according to the customization policy.

On-Line Activated Services License Assembly codes are added to the Sales Package PDM structure containing:

- Leaflets or other marketing material (Services-related material)
- Messaging

- NGage games.

Embedded Services (always on) or production/off-line activated are added to the CTR and they may include:

- Video
- Java Games
- Comes with music
- Maps 3.0.

The MPM's consider the licenses and services process impractical, since different license and service information is difficult to find. The MPM's have to navigate through many different intranet pages to find the correct information about the offering. Services that are in the default offering should be incorporated into the customization guidelines and product variant charts or could be easily selected by the MDC drop down menu. In the current system, searching among different license and service codes is very time consuming and is not very efficient.

#### 2.4 Code Matrix

The purpose of the tool is to make consumer package content data available in an easy manner. Content information is similar to the Enterprise Recourse Planning System (MRP) called R3 Bill of Material (BOM) content and is updated daily. The names of the sales packages come from the gMES system. The MPM's can easily find the whole sales package content and all the codes which have been specified to a specific sales package. Memory card/mass memory and transceiver codes are available as well. There is a handy search feature that can retrieve the product or a certain sales package. All products can be found under the correct factory.

Some of the MPM's consider the Code Matrix difficult to use. In the current system, the MPM's need to be logged in the pages of each factory, and they must to know exactly which devices are produced in a certain factory. This is not a highly efficient use of working time. Some centralized tools would be welcome, where all the codes and items would be found easily. The devices which are beyond or at the end of life should be transferred into some kind of archive database to enable an easier and faster access to the valid devices. For the time being, all the devices which have been produced in a certain factory are found under the relevant drop-down menu. It would be more efficient

to be able to search all the products on the start page with the device name or nickname as a key word.

## 2.5 Content library usage

Content Library is a web-based tool for content delivery of Symbian devices, not for the S40 or S30 devices. It is used for delivering applications and other content to the Device Customization Unit (DCU), and to download sample images sent by the DCU for approval. The MPMs, Program Managers, SW & Services heads and Forum Nokia must deliver all content to the DCU through this interface. The only exception is static content that goes to the variant image, which should be attached to the variant proposals in the MDC.

All applications must be supplied with an Application Information Sheet. The application information sheet lists all the basic information that would be needed to test the application reliability. If the application is an update of an existing version, it would be very beneficial if the application info sheet included a change log or functionality list detailing what changes have been made. This should be requested by the developer. Other contents such as images, videos, sounds, etc. do not need any info sheet.

The Content Library tool is well-known among the MPMs. However, some targets for development are still found. A new application approval process is sometimes too slow, because the repeated 3<sup>rd</sup> party application testing rounds for the same application version, within the same platform release, are time consuming. The internal process should be revised and clarified.

Content Library should be integrated into the MDC, but not as a separate webpage since MPMs have a huge number of different tools to handle at the same time during the variant creation process.

### 3 PROCESSES

Well described and defined processes contribute to a better quality of operation within the processes and between them. Concerted and determined policies will reduce confusion and improve an understanding of the overall operation of processes and all of its phases and details.

The process refers to a sequence of activities, with typically two or several different phases. The process will receive information on the input and produce a particular outcome after the operation. The process is a relative concept, the character of which is determined by the level of analysis. The process may have a repetitive or sequential mode, i.e. it can be carried out time after time either as a repeated activity or in a sequence of defined activities which are not repeated often. In either case, a detailed description of the process is expected, due to process control demands.

Process descriptions are called process models, which are typically graphically presented, showing the structure of the activity and the functions of the related components. Process models describe a particular workflow and will establish the basis of the organization's way of working. The process description helps to understand what is critical to achieving objectives from the organization's point of view. Measurement and development can thus be available for the key stages [5].

It is not necessary to define phases of a process literally. The most important aspect is to understand the purpose of the process and what it is supposed to serve [6]. The processes are related to the organization of the business and can be divided into three major parts: core processes, sub-processes and basic processes. Core processes serve to implement the organization's primary purpose and are always strategically important. Core processes include products or services, specifying company-level implementation actions. In this case, the variant work can be seen as a core process. Basic processes are typically the organization's internal processes, or enabling conditions supporting the core processes or some parts of the core process operations. Typical basic processes for organizations include IT-management and payroll management. Sub-processes comprise major sub-assemblies of the core processes. They typically implement some independent part of the core processes. In this case, processes described in Figure 8. can be seen as sub-processes.

When attempting to define the process as a core or sub-process, it is possible to apply James Harrington's value analysis as depicted in Figure 8. Below

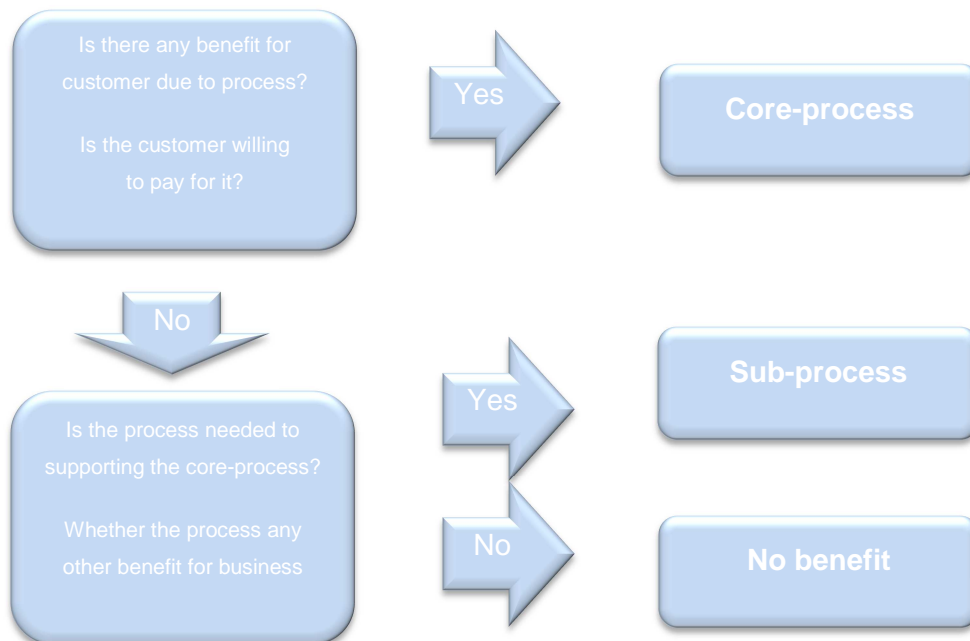


Figure 8. Value analysis about the significance of a process

### 3.1 Variant Approval Code process

To make the most out of limited resources and to ensure that the focus is set on doing the right things, it is important to evaluate the need for each variant before proceeding with its creation. Fundamental to this is a business evaluation of what the intent is behind the respective variant, and whether it makes sense from a business perspective, taking into account the various policies and guidelines that exist for the spotted product.

The Variant Approval Code process has also been developed to increase the visibility of the various variants being initiated. This allows other stakeholders in the process, such as the DCU, to concentrate on creating the required variant without needing to second-guess each variant when proposals are submitted. At the same time, visibility is created to the variant creation process when leaving a mark each time a variant is initiated. This also serves as an early notice for the Sales Unit, because they can see what kind of variants are coming in, even before they are entered into the MDC.



The approval code also enables keeping relevant stakeholders (e.g. at the Global MPM level) informed about what kind of variants are being requested by the MPMs and other variant initiators. The information details relayed will include information about the variant and the business case. Following up this information by using the reporting capability built in the website will provide actionable information that will help to identify process improvement needs.

Before a country or customers variant proposal can be created in the MDC, it needs to have an Approval Code, except for SIM-Card Provisioning Settings (SCPS) and SWU variants. If the new variant is a launch variant or an operator variant, the request has to be discussed with the responsible Account Manager and the Local Sales Unit GM before entering a request into the system. The names of these persons will be recorded only for reporting purposes, and they will not receive any email from the system.

Codes are requested at the Variant Management Approval website, and they are delivered immediately via email. Simultaneously, the Sales Unit (SU) Approver(s) is/are informed that a certain variant is being requested. When an approval code is received via email, it allows the approver 72 hours to potentially react before entering a variant proposal into the MDC.

Once an Approval Code has been received, it must be filled in to the "Approval Code" field in MDC, which is a mandatory field for all proposals (except for SCPS and SWU variants). An approval code can be used only once, and each approval code is dedicated to one variant (and one color) only. The MDC has a built-in functionality for checking that the entered approval codes are valid.

The MPMs recommend that the Variant Approval Code Request process could be integrated into the MDC. The process is now very time consuming and slows down the actual proposal creation procedure. Many MPMs are wondering if all the collected information is useful for someone in the company and they are not certain why the approval code request is needed. Unnecessary mandatory fields should be avoided, for example volumes field, as the volume is always an estimated rather than an exact figure. Some values could be predefined, saved or automatized for each user inside the tool because the MPMs are working with the same customer most of the time. For example, when an MPM is creating five different color variants for the same customer, it would be much faster if some values were predefined.

The Approval Code request process is not clear for RC variants. RC proposals are usually only an update for the previous versions and will not be sold in the earlier specified quantity according to the Variant Approval code request. Some fields like "ATL/BTL Marketing value (USD)" and the "Extent of customization" are being used rarely. In particular, sub-choices for Terminal HW and Sales Package part are limited. There is only one choice in the drop-down menu to be selected.

### 3.2 Additional Variation Request process (AVR)

The Customization Guidelines (CG) define all the variable elements and features for each product. If a customer wants to have variable elements beyond the CG, the request has to be checked concerning the following properties [4]:

- technical feasibility
- customization policy
- capacity
- quality risks.

An approved AVR can then be added to the variant proposal's "miscellaneous" field with the request details and request ID from the AVR database. The proposal can be raised to 01 status after the AVR approval. Every exception is handled through the AVR process. Even if a similar AVR were approved for another product or another customer for the same product, an approval of the new request is not automatic. Few frequently occurring requests have been pre-approved to make the overall process a bit more flexible. The target lead time is about 2 weeks per AVR.

The benefits of these methods are:

- documented decisions (transparency)
- quality improvements
- Nokia-wide policy implementation
- documented implementation instructions
- input for the S40 and Symbian Baseline Guidelines [4].

A pre-approved AVR is a recurring approved customization request that has been approved by LCM customization in policy perspective and technically validated by the Device Customization team, eliminating the need for a new AVR for each product. The pre-approved AVR can be standard, strategic or operator-specific.

The MPMs create AVR for all exceptions that are mentioned in the variant proposal's miscellaneous field. A business case evaluation and volume estimation are also performed. Device Customization team's sales support checks all the needed information in the AVR. They inform the technical development team, who will investigate the technical implementation capability. The Device Customization Unit (DCU) gives its recommendation based on the collected technical information. Figure 9. describes the AVR process flow.

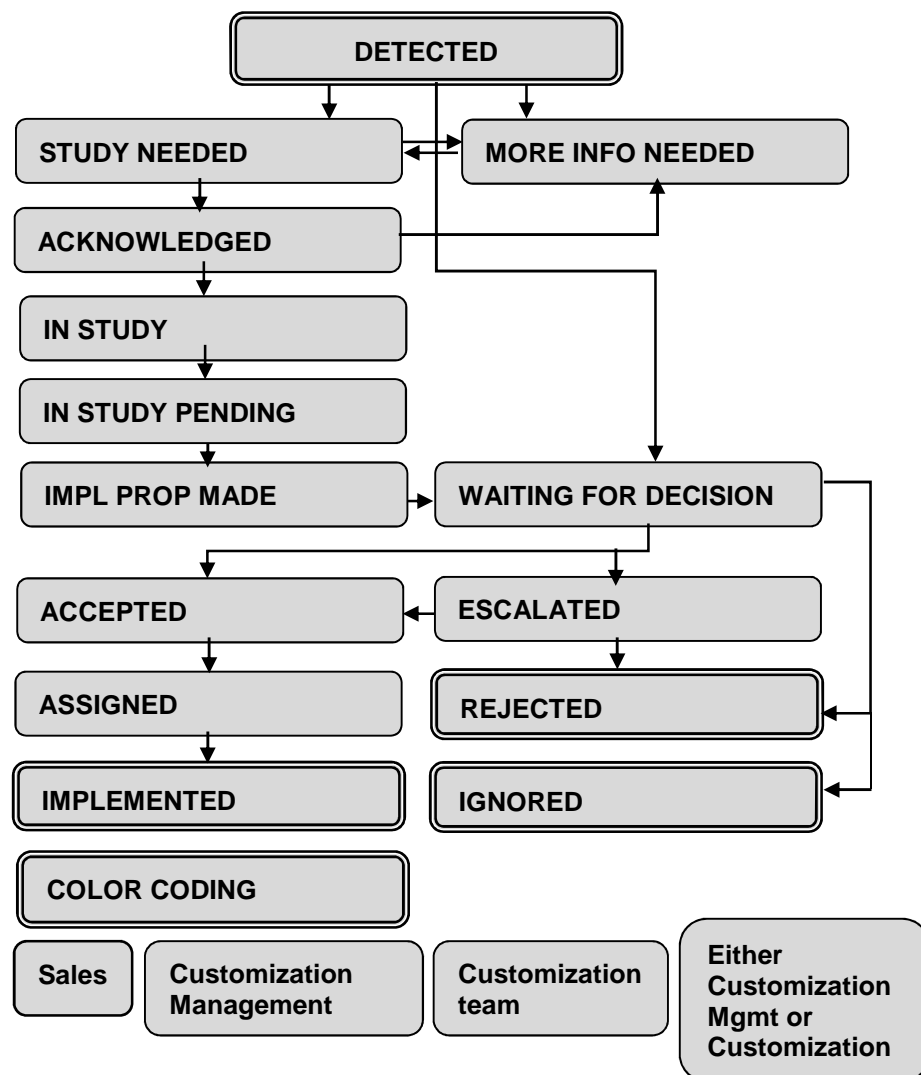


Figure 9. Device SW-related AVR process flow

Most of the MPMs regard the AVR process as clear, but indicate many issues which should be improved for the future. AVR requests are created for the Lotus Notes database and, according to the MPM's opinions, the tool is outdated and very time

consuming. The AVR take too long a time to make a request validated, in comparison to the time variant's total lead time.

The one AVR needs to be reopened many times when MPMs are working with several devices simultaneously. AVR are always device-specific requests, and if the MPM's are working with a certain operator and with several devices, the same AVR needs to be made for each product and operator separately. Some basic settings need to be handled with AVR, since the required feature is not available in the customization tool. Sometimes a fault in the Customization Guideline will cause an AVR. A more proactive and streamlined approach could be introduced, e.g. for receiving more pre-approved AVR, combining them, and completely avoiding some. In summary, the AVR process takes too much time, and two weeks of study is far too long. The AVR team is considered to be a bit inflexible. Figure 10. shows that the AVR is a quite well- known process and that only 5 % of the MPMs consider the process uncomfortable.

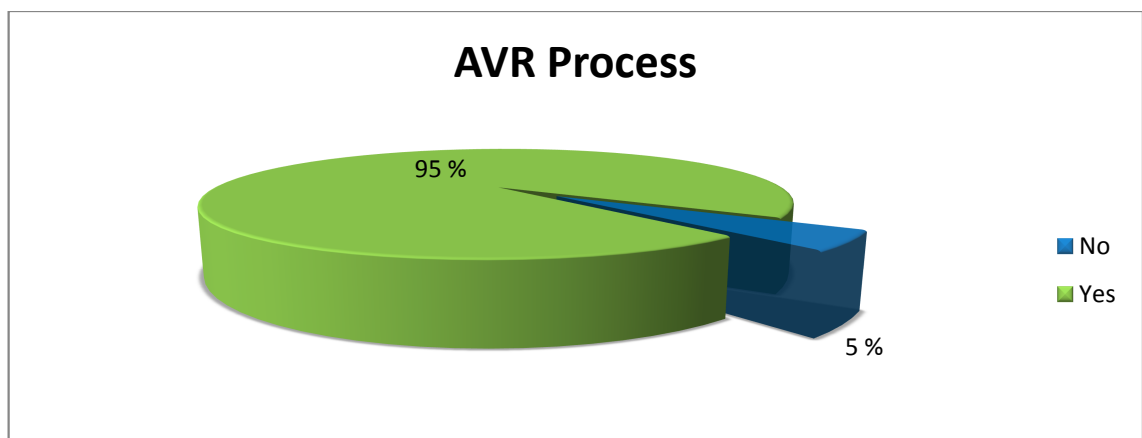


Figure 10. Knowledge of AVR process in general

### 3.3 Lead-time of the variant process

Overall lead time for the variant flow is 25 days. Unfortunately, 25 days is only a target and the real lead time for the meantime is around 38 days. The lead time has increased due to some major software update processes. Target times for each state are as follows:

- proposal creation, MPM 7 days
- sample creation, Device Customization team 6 days
- testing, Operators 7 days
- implementation, Release team 5 days.

The most challenging step to improve is operators' testing time. Strategic customers have their own test houses and if a variant sample is not ready when expected, the test slot is missed. The testing time is postponed to a later date and, in the meantime, the lead time is increasing. For that reason, lead time grows easily by many days or at worst weeks.

Iteration in the state of different phases will also increase the lead time. The MPMs can make some mistakes when a variant content is determined. Therefore, a variant will be demoted in the MDC and the specification needs to be recreated. Variant coordinators may find some settings which are not possible to implement or some settings are incorrectly identified. Sometimes a file format may be defined incorrectly. For example, menu icons are typical cases of a wrong format. As a result, a variant has to be demoted back to "00 Draft" status and then the MPMs must make the specification again.

When an e-sample has been sent to the customer and he has tested it, the customer may wish to change the variant content or may find that one defined feature is not working correctly. This causes demotion and the lead time will be growing up again.

The MDC opens the process for the ramp-up devices ten weeks before the sales starts. This will cause many delays to the variant delivery. Often the PR software is not ready when the sales start is scheduled and the lead time will be increased. The S40 products use the Cute tool and when the new SW is available, the Cute packages need to be recreated. In practice, Cute generates some extra work to MPMs, particularly when working with new products, although in many cases it will accelerate the variant creation process in the Device Customization Units (DCU).

The Order Driven Variant (ODV) process has changed due to MDC release 7. The MDC has a new activity for customer order approval and MPMs cannot send the approved sample directly to the factory. Previously, MPMs promoted the variant to 04 status and all the variants were released. At the moment, the logistic team checks from the R3 system when the order was received, and then promotes the variant ODV status to 04. This reduces the release team's work load since only the variant with a customer's order will be released. Unfortunately this process will lengthen the lead time in many cases. Nevertheless, the MPMs feel that the ODV process has improved significantly during the last 6 months.

### 3.3.1 Prioritization process

New variants, proposal updates and SW update variants are included in prioritization. Every sales unit has its own weekly variant. Variant prioritization input comes directly from the sales units. Sales units will receive accurate and realistic information of the variant sample delivery schedules. The prioritization model enables a more efficient use of variant creation resources. The Device Customization Unit's (DCU) variant creation capacity is 50% for new variants and proposal updates, and 50% for SW updates proposals.

Only variant in 02 status and 04 status in the MDC can be added to the priority list. Every sales unit can add no more than three most important variants to the priority list. They will send the list to the Head of Operative Product Marketing person who will make the priority list. He will send the list to the DCU for creating the final list of priority variants and follow the list when planning future workload.

The sales unit prioritization list covers the following aspects:

- go to market plans
- strategic customers and partnerships
- marketing campaign schedules
- high sales volumes for some variants
- factory production schedules
- care channel needs[4].

The MPMs face many problems if urgent variant proposals fail to be in status 02 when the priority variants are extracted from the MDC. There could be a problem in the variant creation with non-approved AVR's or some problems with the MDC model. It may also happen that, as a result of a minor correction just being made, the proposal appears in status 01 as is excluded from the priority list, even though it would soon be raised back to status 02. Sometimes an urgent variant is dropped from the priority list if it is blocked in status 01 because of some other activity, i.e. SP coding activity in status 01. All this will cause delays in the variant flow, if variants do not have the correct status when the prioritizations are made.

The MPMs indicate that top three variants are not enough, since some LSU's have more than five countries. It is sometimes difficult to have local variants be included in the priority list. Big volume variants are always more important than local ones with

small volumes. The prioritization process would be much easier to handle with the help of some HTML based tools instead of sending mail back and forth.

## 4 COMMUNICATION

Communication is a tool and a capability in the project. As a capability, communication improves the ability to use resources of the project in parallel such as time, money and human resource. Efficient communication is not realized by itself, but it has to be planned and managed in the same way as the use of other resources of the project. Communication requires the same kind of systematic resource allocation as time and efficiency, for example.

In distributed environments, communications are often based on the use of groupware tools such as e-mail, video conference, Telco conference, wiki, and instant messaging. Typical collaborative problems are related to poor communication, high response delays, lack of face-to-face contact and lack of understanding, which can cause frustration and a poverty of motivation and interest [7]. Project communication should be systematic, continuous, well planned and informative in the right way. With a well-constructed and implemented communication plan, project management can engage people to work for the project and through this facilitate the overall project operations.

Kai Ruuska has listed five important factors for project communication:

- Project communication is a supporting activity, which makes it possible to create an end product from the project, and transfer it to both customers and end users.
- In order to create a positive and reliable service profile, communication is needed for both profiling and being profiled.
- Project communication is an informative tool, which communicates to all parties concerned what is happening in the project.
- Orientation activities rely strongly on communication. This is important when different specialists working with project are given proper orientation.
- By the social nature of people, interaction with each other is needed in order to satisfy the social needs of human nature. [8]

During its life cycle a project is more or less a company working organization. From the organization's viewpoint, communication is a connecting factor that links the parts of the organization together and also the organization to its environment. The goals of



organizational communication can be concretized by asking why people communicate as shown in with Figure 11. [9].

<b><i>Operations support</i></b> Communication is needed to turn out the project's services and products and bring them to the client and end-users
<b><i>Profiling</i></b> Communication is needed to create a desirable image or service profile for the project.
<b><i>Informing</i></b> Communication is needed to tell what is going on in the project.
<b><i>Engaging</i></b> Communication is needed to initiate the members of the project team into the project type of work and working methods.
<b>Social interaction</b> People are social and communication is needed for gratification of social needs

Figure 11. The dimensions of organizational communication [9].

Projects can directly influence the first four forms of communication on which the "profit making" of the project remarkably depends. In projects, profit is usually seen as reverse of the ordinary definition, i.e. the best result can be achieved by reducing spending to the minimum. This underlines the importance of the operational communication that directly supports and promotes the production process of a project. On the fifth form of communication, the social interaction, projects have no direct influence or control. Social interaction is also called networking or grapevine. In projects it is necessary to be able to utilize both formal and informal communication channels effectively. A formal project organization is like a clock that the informal communication channels make tick. [10]

#### 4.1 Communication with customer

Communication between the customer and the MPM is an important phase in the variant creation. There is a wide range of different methods on how the MPMs are

collecting the needed information about the desired customizations. Some operators have their own tool and others have a basic Excel sheet, where all the variant requirements have been specified. The MPMs may create the MDC proposal (Feature summary.xls) for the customer about the proposed customization, but this is possible only with an MDC full model feature.

Email is the most used communication tool together with different attached documents. Some of the MPMs usually send a complete information package by email to the customer and they will get the relevant feedback as an input for the MDC work. If the customers do not fill in anything on the form, they just tell it to the MPMs device model and select the color if there is an exception to the regular customization parameters. Phone calls to customers are an often used method as well. Some MPMs set up meetings with the customer and arrange an agenda for the desired requirements in this session.

The variant content can be based on the previously created variant or in some cases global variants, especially when a variant is created for a strategic customer. Nokia has Global MPMs as well, who will decide on the variations for the strategic customers. The global variants settings are created especially for Symbian devices, but in some cases for S40 devices as well. A global variant is some kind of a based on variant for particular strategic customers. Local sales units are able to modify global content to suit their own purposes, but some settings need to be exactly as defined in the global variant.

Many MPMs have a long experience of their customers' needs, and they will know quite well what kind of settings customer wants for the devices. Variant settings seem to be quite similar and the variant content do not differ much in the new devices, so the MPMs simply recycle the existing variant settings to new phone models. Usually the MPMs study the new device Customization Guideline (CG) to see if there are any new customizable features available and they will naturally inform and propose them for the customers.

#### 4.2 Problems in 01 status

The CG specify all the settings and customizable items in different devices. Each product has its own guideline, which may contain mistakes or omissions. Unclear

specifications generate problems, and this will increase the lead time before the necessary specifications have been clarified. It is sometimes difficult to find out the correct person who can provide relevant information to solve the problem in question. Since Nokia is working globally it can even be challenging to know where the device is developed.

The customers' continuously changing customization requirements are also causing a problem. They tend to change the specification many times during the proposal creation process. This will increase the demotion and the variant development is not proceeding in the system. Customer requirements often need clarifying since there may be unclear specifications or specifications that are not possible to implement. The customer's own items, such as applications, icons, videos etc., may be in a wrong format or missing completely. A variant re-creation takes in many cases a lot of time and the variants are not moving forward in the system.

The AVR process is delaying the variant creation process almost in every single case. The AVR investigations take about two weeks per AVR, so the process is in many cases too slow. The same situation can be found in the Content Library process. All the specific contents of a variant have to be approved in Content Library before items are possible to use in a variant. Both processes are time-consuming and will cause delay to variant implementation.

Usually software availability is the bottle-neck at a variant creation. MDC will be opened for the new devices about 10 weeks before the sales start has been planned to take place. Often the software is not ready for production as scheduled, which causes further increase in the lead time, even by many weeks. This is not caused by the MPM, but it will, nonetheless, increase the overall lead time.

Continuously developed tools will cause problems to MPMs. New tools are published often, but older ones remain in use. The functionality of new tools is often not quite stable at the beginning as a lot of bugs might appear. Corrections have to wait and the variant is not moving on as expected. The number of different tools is high and many of the tools have to be actually used before the variant is ready for production. Figure 12. shows the most common problems in the "01 Specification Completed" status.

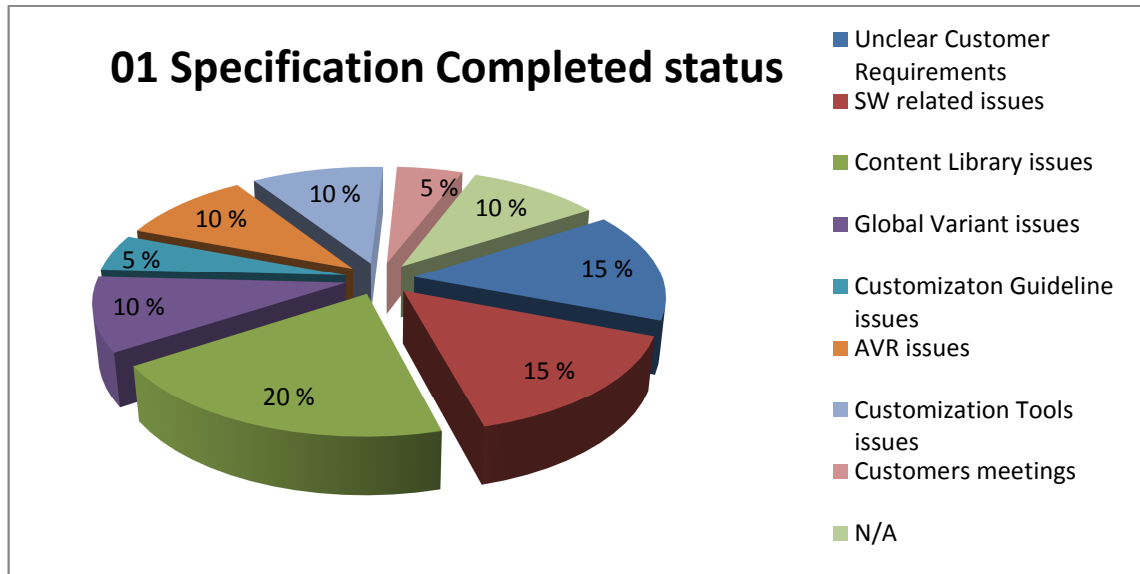


Figure 12. Problems in 01 Specification Completed status in MDC

#### 4.3 Customer approval time and delay

It has been estimated that customers have seven days for completing the sample approval. In many cases this deadline is too short and impossible to meet in practice, when mobile device capabilities become more and more advanced and the number of customers requests grows as well. This can lead to longer operator testing times, as now they have to test all the variants and the customer applications as well. Small customers have only one verification person who should handle all the devices from Nokia and, in many cases, those from all other manufacturers as well.

Big operators have their own test houses, where all the planned tests are carried out. They are usually testing the phone core SW and the variant settings separately, which will cause delay for approval. The variant verification itself takes a couple of days, but the core verification takes longer. The test of the variant is usually allocated a particular given time slot and if the sample is delayed for some reason, the testing time will be lost. In this case lead time will be increased by one week or more. Maintenance devices have in many cases a longer approval time, since these devices are not as important from the customer's perspective as the new devices are. Maintenance devices will be tested only after the higher priority products as the operators do not hassle with older models. Maintenance products are typically only for a CARE/NSU purpose, so orders for these products are not placed even when the customer has

approved the variant. This is a problem if the variant has been created via the Running Change (RC) process, not via the Software Update (SWU) process as the CARE/NSU proposals should be. Figure 13. indicates that customers are well aware of the sample approval target but usually it is not possible to meet it in the required period.

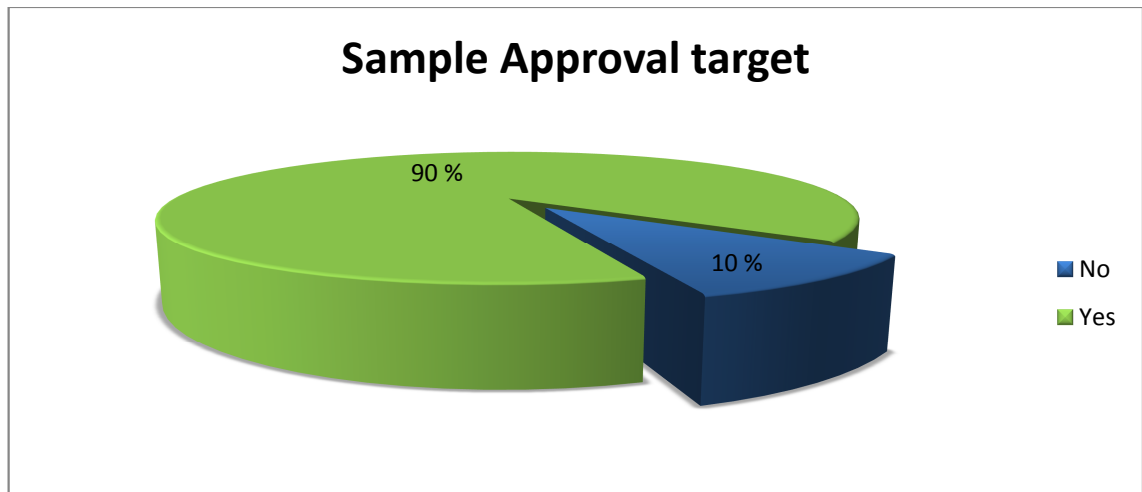


Figure 13. Customer awareness of the target of the sample approval time

Physical sample deliveries have been terminated almost completely and only an e-sample will be sent to customer instead. In some cases the absence of a physical device causes a delay. Sometimes it is difficult to deliver devices to a customer for testing purposes. Devices required for flashing issues or flashing equipment are not available, even though nowadays programming is a much easier, because it can be handled via the USB-port and individual jigs are no longer needed.

Customers may have difficulties to integrate product new variants on their portals or to determine whether a bug is blocking the approval process or not. They may have some internal issues or their internal procedures may take time and slow down the variant implementation flow. This situation is quite complicated, since they rarely inform Nokia about these problems. The customer's applications are not always working as expected and it is not clear whether the problem is in the application itself or in the variant creation. It may take a long time to perform the necessary evaluation and the variant may not be accepted.

## 5 TIME MANAGEMENT

Modern time management can be described as something between an efficient western culture-based and a southern siesta culture. Unfortunately, many 21<sup>st</sup> century organizations are managing their employees in a manner resembling what was called Taylorism in the early 1900's. The principles of Taylorism are to maximize the work performance and control in order to achieve the optimum efficiency. Schedules are tight and the control action will usually be taken too late. Many organizations require their employees to comply with a staggering efficiency and accuracy, which results in a bad work atmosphere and, in the worst case, burn-out.

According to the study by Launis and Niemelä (1999), time pressure and inefficiency occur, in particular, when

- people are eager to meet new challenges and to set new goals but cannot give up anything, while individual employees are left alone to make choices at their own discretion
- work load is growing or the object of work has become qualitatively different, while the everyday work practices of the organization remain unchanged;
- cooperation and networking keep increasing, while the assessment of operations and results of the organization continues to place emphasis on individual performance and its quantitative indicators;
- new development projects, tools and practices continue to be introduced in the workplace, which may be mutually conflicting and all which involve extensive training [11].

Reasonable organizations do reasonable hours of work and at a reasonable pace. People have the opportunity of recovering both during work days and on holidays [11].

Rationality refers to time management as well as to setting targets, planning for time management, and finding efficient working methods in order to achieve the objectives. The development of time management will focus on improving efficiency by applying low-cost measures and by doing things more rationally, efficiently, systematically and faster.

Most people are not planning their time management very well. Many of them do not even have a clear understanding of what the most important objective of the day is. Vince Panella has found three main categories of required actions in order to gain more time on a daily basis:

- Reduce your distractions and time wasters.
- Improve your action systems.
- Increase your human performance.

The first one is fairly obvious. In this category, when removing or reducing issues that steal time and do not move on toward the goals and vision, the total amount of productive time available will increase. By improving in this category, most people can usually gain one to four hours a day.

Examples of reducing time wasters include reducing telephone and personal interruptions, controlling socializing, streamlining and eliminating wasteful meetings. Gaining clarity and focus, as well as setting up and frequently reviewing goals can help enormously in this category.

The action system category can increase the total daily time as it reduces the time needed to perform basic daily functions (e.g. time needed for exercise while actually increasing you results, reducing housework, and reducing the time divided for tasks at work).

The last category in gaining more time in day aims at increasing human performance. By focusing on increasing human alertness, energy, motivation and focus (e.g. by getting enough sleep, eating proper meals and by reducing stress), it is possible to add two or more hours to your day [12].

A few useful hints for time management in general are:

- Spend time on planning and organizing. Using time to think and plan is time well spent. Organize in the way that makes sense. So forget the “should” and organize your own way.
- Set goals. Goals give direction for the life and the way how to spend time. Set goals that are specific, measurable, realistic and achievable. Goals can give creative people a much-needed sense of direction.
- Prioritize and use an 80 – 20 rule. 80 percent of the reward comes from 20 percent of the effort. The trick of the prioritizing is to isolate and identify those

valuable 20 present. Define items with a deadline is another idea to achieve priorities.

- Be flexible. Allow time for interruptions and distractions. With just 50 percent of efficient time planned, it is possible to handle interruptions and any unplanned “emergency”.
- Do the right thing right. Doing the right thing is more important than doing the things right. Doing the right things is effectiveness, but doing the things right is efficiency. Focus first on effectiveness and then on identifying what is the right thing to do and after that concentrate on efficiency. [13]

### 5.1 Data collection from the customer

Data collection from customer varies a lot depending on MPMs and customers. It can take few hours or in some cases even week. Typically it takes one or two days to obtain all the needed information for the variant creation. In general, customized settings are very similar from one device to another and collection of data does not take much time. New features in customization will be time-consuming and then one or two days are not enough. If an MPM is creating a totally new variant for a new customer, it takes considerably more time than in the case of a customer who already has a variant in the system. The customer’s own applications might slow down the creation process, since new applications have to be added to the Content Library and approved as well, before they are allowed to be used. Customizations against the Nokia customization policy always require the Additional Variant Request (AVR). Additional Variant Requests (AVR) should be created well in advance before the sales start, since an Additional Variant Request (AVR) investigation runs for two weeks or, in worst cases, even longer.

Data collection for the global variants naturally takes more time than the basic ones. Typically, global variants have many different customizations and contents that are changed many times during the creation period. While the basic MPMs are not usually participating in the global variants creation, they cannot start the local variants creation before the global one is accepted.

### 5.2 Proposal creation

Proposal creation may take from a few hours to up to one week. Typically, the creation of Country Variants takes only two to four hours, because there are few customized



items in the content. Usually a few bookmarks and some games are added to the content and in some cases e.g. music vouchers and some local network settings. Operator variant creations are more challenging and, of course, more time needs to be reserved for the variant implementation.

Creation time may depend on the used tools as well. Creation time varies considerably depending whether the MDC is a full model or if the Cute tool has been used. The MDC full model is a fast and efficient tool for variant creation. All the devices have their own model in the MDC, and each model has device-specific settings. Some features may be missing from the configuration model, and a so-called “defect ticket” has to be created for MDC support. Sometimes the device’s core content may be changed during the new release or some features could be changed after a new MDC release. If the feature or settings in question have been customized in a previous variant, the MDC configuration cannot be saved and published. A ticket for MDC Support is needed and before the ticket has been investigated, a lot of time has been wasted.

Variant creations with the Cute tool have increased the MPMs’ workload. The tool itself is quite efficient, but unfortunately bugs appear frequently and the tool is not stable. Sometimes the Cute package needs to be created from scratch instead of simply updating an existing file. Although there has been improvement in this issue, occasional difficulties continue to crop up.

Iterations between status 00 and status 01 will cause significant delay to proposal creation. Different mistakes in the proposal creation will cause demotion and the MPMs have to make corrections to the proposals. This will increase the workload of MPMs and they have to schedule time management carefully. Proposal creation time depends heavily on the tools used and on how demanding customizations are requested. In general, it takes about 0.5–2 hours as shown in Figure 14.

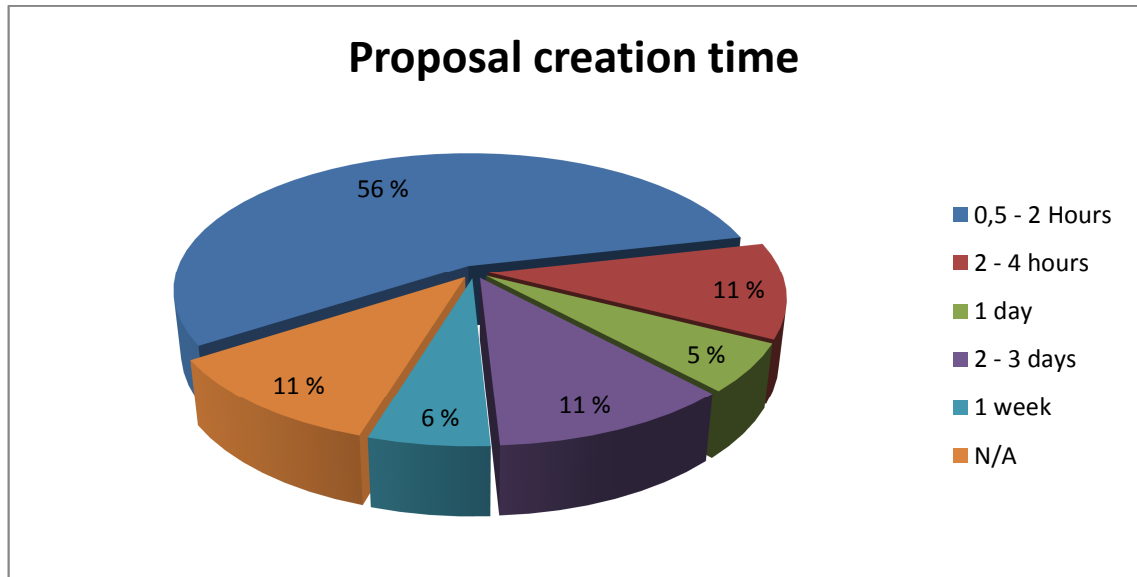


Figure 14. Total time spent per one proposal

### 5.3 Meetings with customers

The practice of having meetings with customers varies a lot in different Local Sales Units (LSU). Small units naturally have fewer resources than the big ones; thus most of the communication is managed via e-mail, phone or Telco call. The average time for meetings is one hour per week, but this depends, of course, on the LSU. Since an MPM may be responsible for many operators, the amount of time spent on meetings may be much higher.

Strategic customers arrange meetings on a weekly basis. They may have different meetings for customer briefings, changes description and negotiations related to on device customization. The MPMs working with strategic customers have to prepare their time management carefully. Variant creations are typically more demanding, since customized items are more challenging than ordinary variants.

Many MPMs arrange weekly meetings with their customer using either weekly Telco calls or face-to-face meetings. They discuss the various variants and software topics and explain how to handle complicated issues when new features are implemented. Some MPMs arrange monthly meetings and discuss all customization topics there. Some LSU organize meetings rarely, since they have a wide area and many different customers to take care of.

A weekly or daily Telco call with the customer in these days is a commonly used way of arranging meetings. A Telco call is an efficient and time-saving way of working, especially when the distance between the customer and the MPM is long. All the needed topics can be conveniently discussed and even some documents shared or pre-customized devices presented from the phone emulator on the screen. Some MPMs do not organize any meetings at all. They will solve everything over phone or by mail. The frequency of meetings depends heavily on sales units. Some sales units arrange meetings on a weekly basis and others rarely or not at all, as shown in Figure 15.

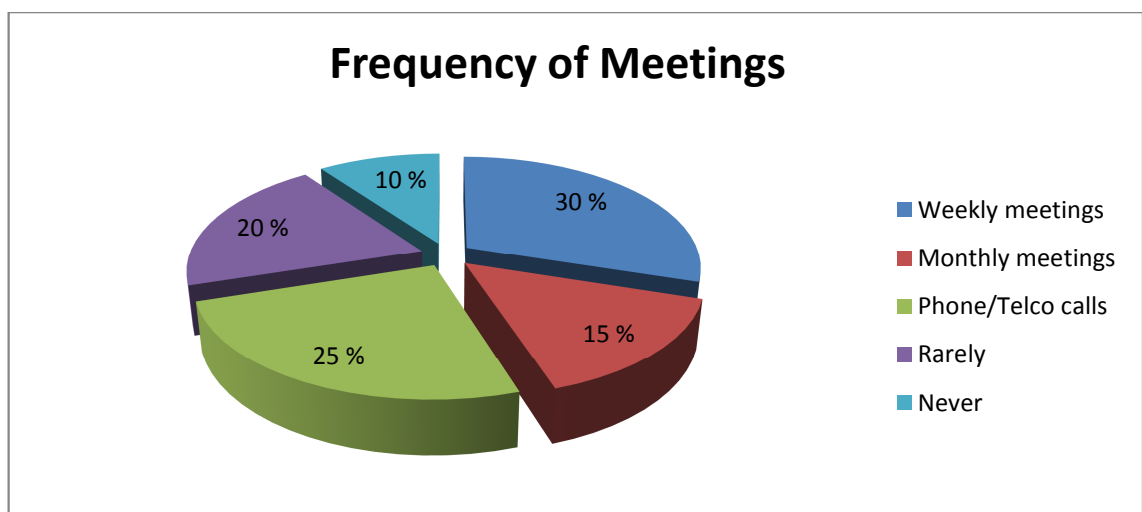


Figure 15. Meetings arranged with customers

Megaoperators arrange variant camps a couple of times per quarter. Typically, operators discuss the new devices and decide on customizations during the camp. A global variant is typically created in the variant camp.

The company's own internal meetings have to be taken into account as well. LSUs have their own meetings and many other meetings are also related to the variant work. A company arranges different campaigns and the MPMs are also involved in the planning and negotiating. New device meetings are arranged weekly and a few device programs are usually going on at the same time. The meetings will typically cover Device Program status, MPM's variant status LSU's variant plans and readiness, among other topics. As a summary, the MPM's calendar is fully booked and his time management must be planned carefully.

#### 5.4 Other time management-related matters

The checking of an individual variant from the MDC's point of view is a quite complicated task and it takes a great deal of time to receive more information on why a specific variant is pending. In some cases it could even be set on hold. Usually, a valid reason is given for why the product fails to move ahead, but sometimes there is no explanation for why a variant was put on hold. Some variant demotion details may have been missing or are not understandable. The MPMs have to contact the coordinator and request more information on how to repair a certain variant. Variant schedule estimations have to be asked from several different teams especially in urgent situation. In many cases, different requests from different teams may delay the variant development by one or two days, simply because the global company and its employees are working in different time zones.

Last minute changes in the customization or an error correction in the e-sample may delay the variant process as much as by one week. The MPMs have to arrange negotiations and meetings after the e-sample has been tested and to discuss with the customer on how the required changes are to be implemented. Some of the MPMs will participate in the global variant team meetings and this has to be taken into account in their time management. Strategic customers will arrange typically one or two Variant Camps per half a year, depending on the device's ranking. Participation in the camp will take two or three days.

When the new device is published, the MPMs must read the CG carefully and clarify all the new features and requirements of a particular device. This is very time consuming, since Nokia publishes many devices and different platforms every year. The MPMs have to figure out whether any customer-specific requests can be implemented or whether this feature is supported in the device. The AVR's creations for the new devices have to be taken into account when the MPMs are planning their time management. The AVR process is quite slow and filling in the AVR requirements takes time. The AVRs should be ready well before the variant proposal creation, but, unfortunately, the necessity for AVRs is typically realized during the proposal creation process. The same situation occurs in the Content Library process. Before the application has become approved for the variant creation, a couple of weeks are usually lost.

Many of MPMs consider the Cute tool and MDC bugs fixing is a waste of time. Small changes to the variant and a rebuild of a totally new Cute package from scratch when a new SW arrives is really frustrating. The creation of new Cute packages from scratch takes one or two hours per variant.

## 6 MPM TRAINING

Arrangement of training is always an organizational decision, the objectives and implementation of which should be considered carefully. Training helps the employees' commitment in the organization and their job satisfaction will be increased because the employees feel that their work is meaningful and they understand better the overall target of the organization. From the perspective of organizations, employees who are involved in continuous training work more intensively and typically develop their competence all the time. Training benefits can be seen in the form of customer satisfaction, high work quality and an increased performance [14].

The different teams must invest in continuous training and education so that the team members are well versed in the latest technological solutions. Data from across the industry indicates that training contributes directly to project success. Better educated teams perform their jobs with greater success than teams that have not had the opportunity to participate in training sessions [15].

On-the-job training is the most popular and useful training methodology for developing highly competent personnel as a part of practical training [16]. The MPM training seems to be mostly managed by using a "learning by doing" method in the sales units.

### 6.1 Training overview

Training sessions are held around twice a month. Invitations will be sent by e-mail for all the MPMs in the company or training schedule can be found on the intranet and the Device Customization web page. Variant proposal creation, variant-related processes and tools are included in each training session. Certain specific trainings are arranged, e.g. when some new tools have been implemented or some new features are added to the tool or there have been changes in some process. Training invitations can be checked on the intranet, but the calendar invitation is a commonly used method to sign into the training session as shown in Figure 16.

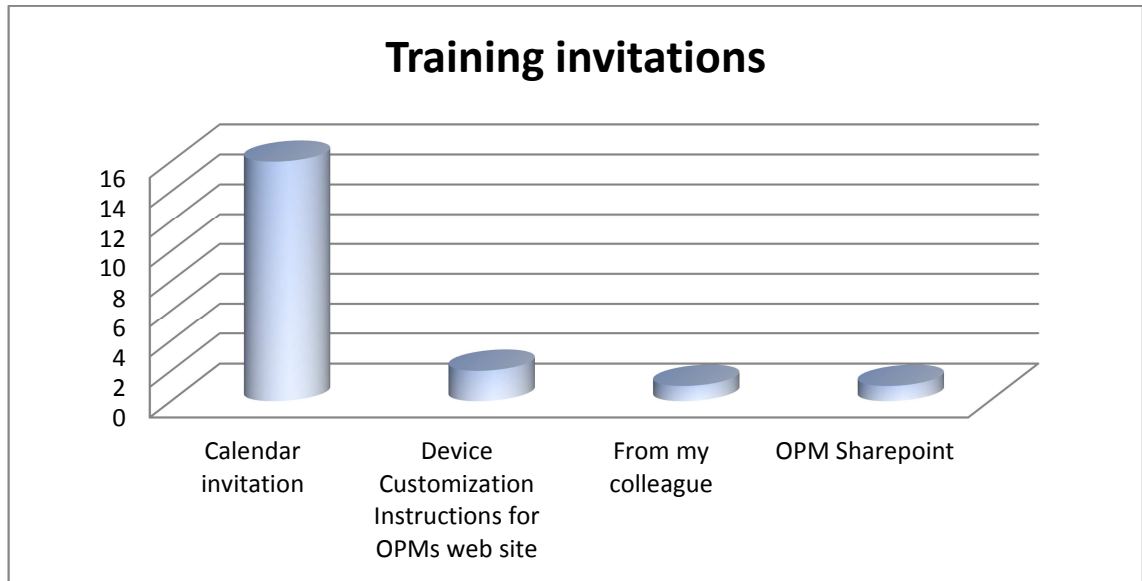


Figure 16. How training invitation has received

If the MPM is not able to participate in a certain training session, all training materials are available in the intranet for study afterwards. There are a few training videos for Cute in the Intranet as well, which describe very well the Cute customization processes.

The MPMs regard the general “way of working” trainings as very useful. They usually participate in the training sessions once month, if possible. Some MPMs consider that there is too much repetition of known things and that a two-hour training session is mostly waste of time if only one or two new topics are introduced. Training seems to be more useful for new MPMs, because the MPMs with a longer work experience are quite familiar with most of the themes discussed in the training sessions.

Most MPMs participate in the training session once a month. Typically, they explore the topics of the training session and make a decision based on the agenda. Participation frequencies can be seen in Figure 17.

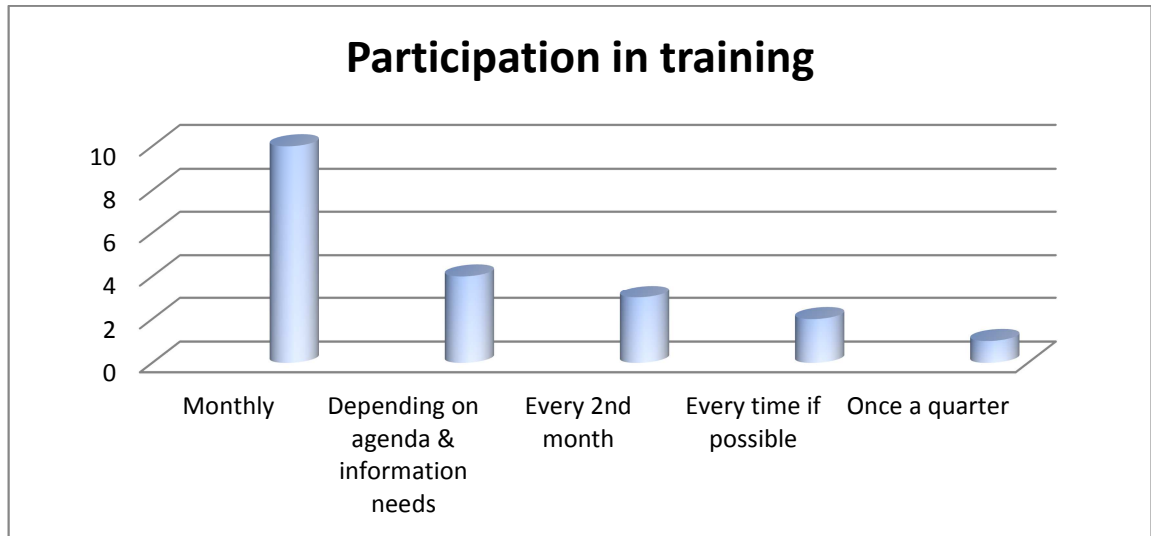


Figure 17. Participation frequency

## 6.2 Training for new MPM

Questions were also asked about how the new MPM is trained for the new tasks. The work as an MPM requires extensive knowledge of variant creation for different customers. A huge number of different tools and processes are handled before the variant is ready for production. The big sales units have MPMs who will negotiate with the customer and who do not contribute much to the actual variant creation. There are also Variant Specialists who create the variant proposals for the MDC and who are more aware of the technical details. Small sales units do not have as many employees as the big ones, and therefore the MPM usually takes care of the whole process. Nokia has a number of different instructions for different processes, but these seem to be difficult to find on the Intranet.

## 6.3 Instructions for new MPMs

Different instructions are available for the new MPMs on the intranet. Device Customization has its own web page "Instructions for MPMs", where all required information about the software customization is collected. It is possible to find e.g. dates and programs of coming training sessions, contact information, instructions on how to get started, and disposable tool information on the Intranet.



The MPM Share Point is the place on the Intranet where a lot of information and instructions are available. This site provides all the necessary information that a new MPM will need when he/she starts in the organization. It contains e.g. instructions for the tools, contact information, roles, responsibilities and links for the different Sales Unit pages.

The Variant Management page introduces all the variant process roles and stakeholders. The Variant Management process is one of the few processes that is truly end-to-end, covering multiple organizations and teams in all three Business Units - Devices, Services and Markets. In brief, customization is the “What and Why” - in others words, it is the strategy, policies and platform/product customization guideline that makes Nokia’s approved offering i.e. the rules that are used as part of Variant Management, including any exeptions. A lot of valuable links are availble in the Variant Management page for the new MPM as well [4].

The Variant Task Force team are supporting team for the European MPM’s. They have a wide experience of the variant work on every level. They will help the MPM’s with all of the problematic issues in variant work and the team is working in close cooperation with MPMs. Team is quite well known and response fast for the MPM’s questions. They have been handling for example some centralized updated process and followed up the variant lead time processes. Especially centralized updated exersises will reduce the local MPMs workloud and MPMs have more time to concentrate their main tasks.

The most commonly used way of training is the new MPM “learning by doing” method. MPM’s knows well where the instructions are located. Only few of them do not know where to find more information and the correct instructions. Most MPMs participate regularly in the MPM’s training sessions and they keep the sessions useful. Local instructions are rarely used, but MPMs create usually own check list for variant creation and for the particular customer to maintain a high quality and service level. Figure 18. shows how instructions are available and how the training is handled in the LSUs.

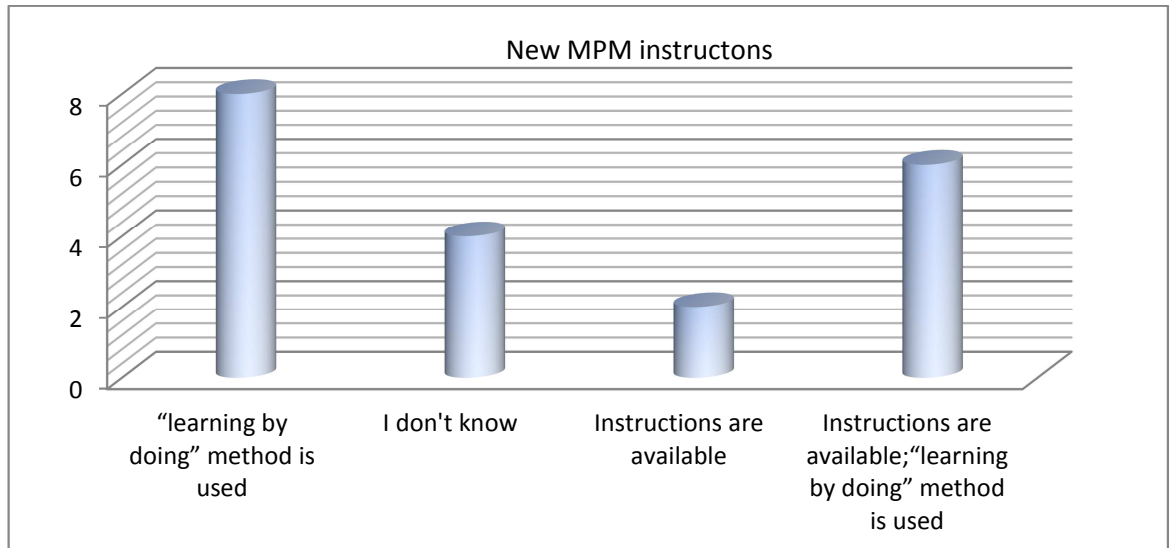


Figure 18. Availability of instructions for MPMs

Different types of pilot projects are arranged especially when a new tool or process is implemented. Typically, particular LSUs participate in the pilot exercise and test the new tools including all the possible features.

## 7 BACKGROUND INFORMATION OF PARTICIPANTS

The survey was conducted only for the European sales units. The total number of respondents was 20 out of 48, which provides quite a reliable result. Typically, the participants' response rate in similar surveys is 25%, when organization-internal inquiries are conducted. In this survey, the response rate was 41.5%. All of the eight sales units were represented; therefore, the survey gives a good picture of the current situation. The locations of sales units and the numbers of participants are shown in Figure 19.

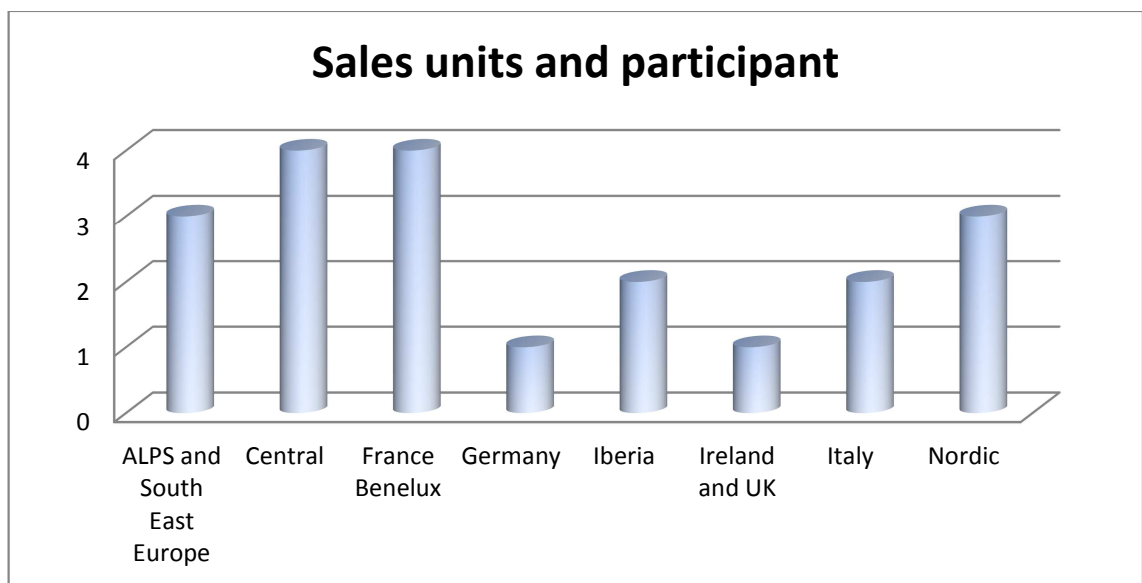


Figure 19. Sales units

The survey participants have a wide range of working experience. Some of them had just started in their job but the majority of the MPMs had several years of experience. Figure 20. presents the work experience of the survey participants.



Figure 20. Participants' work experience in years

The survey provided a good overall picture of the variant work based on the participants' work experience. Especially the training-related topics were very valuable from a new MPM's point of view.

## 8 DISCUSSIONS

The variant customization tools have been continuously developed while this thesis has been written. The Carbide.v and the Nuage tools were published at the end of last year. The Carbide.v is used for the Symbian^3 devices customization and the Nuage for the customization of all platforms. The Nuage will replace the Cute tool and the Carbide.v during the latter half of this year. The Nuage is currently at a pilot phase and the tools have been tested using Symbian^3-, S40- and Meego devices. The main problem seems to be a different User Interface (UI) view. The S40 and the Symbian^3 UI are similar but the Meego has a differences. This can be confusing from the perspective of the MPMs, and the UI's should definitely be identical for all platforms. The MPMs' opinions should be taken into account when new tools and processes are developed.

The MDC is considered to be an efficient and well-working tool, but at the moment it is more like a work flow tool, and the variant customization is implemented by using other tools. Some of the tools and processes should be integrated to each other. For example, the variant approval code request should be a part of the MDC or it might be removed completely. The NDT and SP codes should be easily searched from the MDC, instead of having to open several intranet pages or excel sheets. Many tools have been automatized to facilitate end user operations; however, on the other hand, manual work has been increased elsewhere.

The most challenging phase seems to be the communication between different internal teams. There are a many stakeholders in the variant business and the same tasks are performed in many countries. The working methods are slightly different depending on the business units, although the way of working should be similar in every level. This can be confusing from the MPMs' point of view, because inaccurate instructions may exist for one and the same task. The meeting practices should be adjusted and only the right persons should participate in the meetings. It is common that many people are invited to the meetings, most of whom can contribute nothing to the matter being discussed.

Communication between the customer and the MPMs is working well. Most of the MPMs have a long experience of customers and working methods in the field. Customization is quite similar for the particular devices and customers. The most problematic phase is to get acceptance for a variant, especially for the older devices. In

principle, the customers have 7 days to make a decision on whether they take or do not take a particular device from the selection, but, unfortunately, the decision process typically lasts much longer. The services offered by Nokia can be seen as a problem for some strategic customers. If they want to offer their own services rather than those of Nokia, removing a certain feature is often quite complicated and, typically, AVR is needed.

Planned schedules for new devices are often delayed, which will cause problems for the operators. The operators are planning for their marketing campaign and for the new device, but for one reason or another, the device is not ready for the sales start as estimated. Typically, the software is not as good as expected or some critical errors may be found which give rise to the need for a new SW release. Unfortunately, the MPM is not able to influence the SW development.

Time management depends heavily on the type of the customer and on the job description of the sales unit. Big sales units have MPMs to negotiate with customers and variant specialists who will create the decided customizations for the company's systems. Small sales units typically have only MPMs who will handle all the variant creation tasks. The MPMs have to reserve more time for negotiations and meetings with big operators than with the smaller ones. Strategic customers usually have customizations which will need an AVR or require that some application or game is added to the Content Library. The same situation may, of course, occur with regard to all operators, but it is more common with regard to the strategic ones. These issues have to be taken into account, since both processes are quite time-consuming. Whenever feasible, it should be made possible to handle both processes in advance.

MPM training is considered useful for the MPMs. However, continuously changed customization tools and the processes required for the training sessions should be targeted more precisely. Training for new MPMs and more experienced MPMs should be separated. Typically, the training session lasts around two hours and it may be difficult to find time for it. Various pilot projects are meaningful but, unfortunately, all MPMs cannot participate because their timetables overlap. The findings of this thesis can be used, for example, as training material for the new MPM's.

## 9 CONCLUSIONS

The purpose of this study was to explore the pain points and working methods in the customization work. The scope of the study was limited to consider only the European sales units and the MPMs' work within them. A total of 48 MPMs are working in the European sales units, and 20 of them participated in the survey, which is a quite good result in a company-internal inquiry.

Customization work is quite challenging because it involves many different processes and a huge number of different customization tools. Continuously developed tools are changing all the time and new tools are published quite often. Typically, a new tool does not replace the old one; instead, it increases the range of tools that the MPMs have to handle. Communication between different customization teams and stakeholders can be seen as a major problem and the relevant information collection is quite difficult in many cases.

The results of the thesis gave a good overall picture of the problem points found in the MPM organization. The findings of the survey can serve as useful reference points in attempting to solve the problems found, and special attention should be paid to these areas in the future.

This thesis contains very detailed information about mobile phone customization, which can be used for customization business purposes only. The processes and tasks have been explained with a special reference to customization work, whereas the sections on communication and time management are of a more general nature.

It would be interesting to conduct a new survey related to the new customization tools. Its results would shed new light on whether any improvements have been achieved to facilitate the MPMs' work.

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## Survey

This questionnaire for LSU MPMs is trying to map working methods and pain points in MPM daily work. Goal is to improve and develop MPM work and co-operation between MPM and the customer using the questionnaire results as a reference. In addition we intend to create a better understanding of MPM needs in daily work.

We appreciate all the replies to the questionnaire in order to provide a comprehensive survey sample.

The questionnaire is anonymous.

### 0 BACKGROUNDS

0.1 What is your local sales unit?

- a) ALPS and South East Europe
- b) Central
- c) France Benelux
- d) Germany
- e) Iberia
- f) Ireland and UK
- g) Italy
- h) Nordic

0.2 How long have you been working in MPM area? \_\_\_\_\_

0.3 Is your main daily work focus to create proposals for the customer? **Yes / No**

If No, what? \_\_\_\_\_

### 1. TOOLS:

1.1 Variant Approval Code Request – Is the process clear enough? **Yes / No -> Comments:**\_\_\_\_\_

1.2 Customization Guidelines – Do you know where to find up-to-date CGs? **Yes / No**

1.3 Variant Charts – Do you know where to find the latest Variant Charts? **Yes / No**

1.4 AVR (Additional Variation Request)

a) Is the process clear enough? **Yes/ No -> Comments:**\_\_\_\_\_

b) Do you know where to find instructions regarding AVRs? **Yes / No**

## 1.5 Content library

- a) Is the process clear? Yes/No -> Comments:\_\_\_\_\_
- b) Do you know where to find Content Library and instructions for usage of it? **Yes/No**

## 1.6 Cute

- a) Are you familiar with using Cute? **Yes/No**
- b) Do you know where to find instructions? **Yes/No**
- c) Any problems to choose correct based-on (NDT)? **Yes/No -> Comments:**\_\_\_\_\_
- d) Is color update (CU) process clear when using Cute? **Yes/No -> Comments:**\_\_\_\_\_

## 1.7 PA-Tool (Product Approval Tool)

- a) Is it clear why PA-Tool approval is needed? **Yes/No -> Comments:**\_\_\_\_\_
- b) Did you know that PA-Tool approval should be done also in MDC ODV activity? **Yes/No**

1.8 Lead time – Do you know target lead times between different states? **Yes/No Comments:**\_\_\_\_\_1.9 Priorization – Are you familiar with priorization process? **Yes/No Comments:**\_\_\_\_\_

## 1.10 MDC configurator

- a) Do you know how to use it? **Yes/No Comments:**\_\_\_\_\_
- b) Do you know where to find instructions? **Yes/No**

## 1.11 MDC common - Is there any unclear matters in the following points:

- a) New proposals No, everything's clear / Yes, what:\_\_\_\_\_
- b) Color updates No, everything's clear / Yes, what:\_\_\_\_\_
- c) Running changes No, everything's clear / Yes, what:\_\_\_\_\_
- d) SWU variants No, everything's clear / Yes, what:\_\_\_\_\_
- e) SP only Variants No, everything's clear / Yes, what:\_\_\_\_\_
- f) Memory card / mass memory No, everything's clear / Yes, what:\_\_\_\_\_
- g) S60 applications in Content Library No, everything's clear / Yes, what:\_\_\_\_\_
- h) Content Library not used with S40 products, all applications and test reports should be attached with MDC Configurator **No, everything's clear / Yes, what:**\_\_\_\_\_

## 1.12 Code Matrix

- a) Are you familiar with this tool? **Yes / No -> Comments:**\_\_\_\_\_
- b) Any proposals for improvement? **Comments:**\_\_\_\_\_

## 1.13 Services &amp; licenses

a) Is there enough information available about Nokia services for customer? **Yes / No -> Comments:**\_\_\_\_\_

b) Is there enough information available about licenses? **Yes / No -> Comments:**\_\_\_\_\_

## 2. COMMUNICATION BETWEEN MPM AND CUSTOMER

2.1 Does the customer have some template or database in use, where they can fill in the customizations? **Yes/No**

a) If **Yes**: please send template to Europe.variants@nokia.com if possible.

b) If **No**: How MPM will get the information of desired customizations? **Comment:**\_\_\_\_\_

2.2 How often you have meetings with the customer when the new variant is requested? **Comment:**\_\_\_\_\_

2.3 The most common problems in 00 (Draft) State? **Comment:**\_\_\_\_\_

2.4 Is the customer aware of sample approval time target? **Yes/No -> Comments:**\_\_\_\_\_

2.5 The most common reasons for the customer approval delay? **Comments:**\_\_\_\_\_

## 3. TIME MANAGEMENT

3.1 How much time is spent in the following states per variant:

a) Data collection (from customer, Nokia)? **Comment:**\_\_\_\_\_

b) Proposal creation? **Comment:**\_\_\_\_\_

c) Meetings with customer? **Comment:**\_\_\_\_\_

d) Something else, what? **Comment:**\_\_\_\_\_

## 4. NEW MPM

4.1 "Starter set" - Are there any special instructions available for the new comers in your LSU or will induction take place on "learning by doing" basis? **Instructions are available/ "learning by doing" method is used/I do not know**

4.2 Is a mentor nominated for the new MPM (e.g. from among colleagues)? **Yes/No**

4.3 Are you familiar with the following pages and can you easily find the necessary instructions from the page?

a) Device Customization (Instructions for MPMs)? **Yes/No ->**

Comments:\_\_\_\_\_

b) MPM SharePoint? Yes/No -> Comments:\_\_\_\_\_

Have you had need for local instructions or is needed information available in MPM SharePoint / DCU pages? **Local instructions are used (Why?)/ Information can be found from MPM/ DCU pages -> Comments:**\_\_\_\_\_

Variant Management & Customization (VMC) EMEA

a) Are you familiar with the VMC EMEA pages? **Yes/No**

b) Any proposals for improvement? **Comments:**\_\_\_\_\_

Variant Task Force/ MPM Support

a) Are you familiar with Variant Task Force/ MPM Support? **Yes/No -> Comments:**\_\_\_\_\_

b) Any proposals for improvement? **Comments:**\_\_\_\_\_

5. TRAININGS

5.1 Are the monthly Device Customization Ways of working trainings useful for you? **Yes/No -> If No, why?**\_\_\_\_\_

5.2 Do you still need Cute trainings? Yes/No -> If Yes, What kind of Cute training?\_\_\_\_\_

5.3 Are the Sales Package (SP) related trainings useful? **Yes/No -> If No, why?**\_\_\_\_\_

5.4 From where do you get information on trainings? MPM SharePoint/ Device Customization Instructions for MPMs web site/ By receiving calendar invitation from Katariina Kemppe/ From my manager/ From my colleague/ No where

5.5 How often you participate in training sessions? **Comments:**\_\_\_\_\_

5.6 Do you have any proposals for improvement or other areas where you need more training? **No/Yes -> Comments:**\_\_\_\_\_

6. OTHER COMMENTS \_\_\_\_\_