Developing process of administering scriptable objects across installed base

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Degree Programme in Business Information Technology, Developing Digital Services

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The goal of this thesis is to develop the process for managing a large installed base of scriptable objects, aiming to streamline and standardize their administration across different departments in one organization. By implementing this process, my objectives include reducing deployment times, ensuring uniformity, enhancing quality, and improving user satisfaction throughout the script lifecycle. Given the complexity and time-consuming nature of the subject matter, the thesis will focus solely on establishing the process using one of the commonly employed process design methodologies and associated tools.

In terms of Six Sigma for scriptable objects there were assigned certain design requirements which new process aims to ensure that scriptable object will receive. One of these are that each scriptable object should be code signed. Process has ensured that these scriptable objects are traceable across installed base whole their life cycle. Process has been designed so that it is measurable and improved in future. These has been implemented with help of process helping tools that had automated administering them and their associated documentation. By centralized process process has been standardized across departments also as scriptable objects itself.

Keywords: Six Sigma,DMADV,Process Design,Scripts,Administration

Tämän opinnäytetyön tavoitteena on luoda prosessi, jolla pystytään hallinnoimaan suuri määrä skriptattavia objekteja nykyisessä suuressa asiakaskunnassa. Prosessin tarkoituksena on yksinkertaistaa ja standardisoida näiden skriptattavien objektien ylläpitoa eri osastoilla nykyisessä organisaatiossa. Prosessin tavoitteina ovat pienentää asennusaikoja, varmistaa yhtenäisyys, parantaa laatua ja lisätä käyttäjän tyytyväisyyttä koko skriptattavan objektin elinkaaren. Ottaen huomioon tehtävän aikaa vievä luonne ja vaativuus, opinnäytetyö keskittyy perustamaan prosessin käyttäen yleisesti käytettäviä Six Sigman prosessin luonti metodologioita.

Six Sigma puitteissa skriptattaville objekteille oli asetettu tiettyjä suunnitteluvaatimuksia, joiden uuden prosessin on tarkoitus varmistaa objekteilla olevan. Yksi näistä on skriptattavien objektien koodin allekirjoitus. Opinnäytetyössä oli tehty mahdolliseksi näiden skriptattavien objektien jäljittäminen koko elinkaaren koko asiakunnassa. Ylläpitoprosessi oli muodostettu siten, että se olisi tulevaisuudessa mitattavissa ja parantavissa. Tämän oli toteutettu prosessia auttavien työkalujen avulla, jotka ovat mahdollistaneet näiden objektien ja näihin liittyvän dokumentaation automatti-sen hallinnoinnin. Keskitetyn prosessin myötä oli saatu hallinnointi standardisoiduksi eri osastojen välille kuten myös standardisoitua itse skriptattavat objektit.

Asiasanat: Six Sigma,DMADV,Prosessien suunnittelu,Skriptit,Hallinnointi

Contents

1 Introduction

The goal of this thesis is to develop the process for managing a large installed base of scriptable objects. The goal of the process is to streamline and standardize their administration across departments in the organization. By implementing this process, objectives include reducing deployment times, ensuring uniformity, enhancing quality, and improving user satisfaction throughout the script lifecycle. Work will encompass certain challenges in skills like programming, time management, prioritizations of tasks, communication and leading the process with many different stakeholders which I will try to analyze during this work.

In this diary-based thesis work I will describe the development of the process divided into 8 weeks period between 27.02.2024-10.05.2024 time interval. Given the complexity and time-consuming nature of the subject matter, the thesis will focus solely on establishing the process using one of the commonly employed process design methodologies and time management practices with supplemented literature references.

In the beginning I will describe the background of the subject matter by reviewing the company background, professional terminology, and own skills. I will describe these in context of my current role and how they align in context of developing this process and what literature could be used to encompass It.

The diary concept has been chosen as one of the methods to make self-analysis of progression of own work for later retrospective analysis for own and employee needs for this rather complex process. It was considered that some of the approaches used could be used across organizations. They could be used to improve cooperation between different teams and stakeholders, especially in the sense of own time management and communication.

In conclusion part I will perform analysis how developing process for standardization has succeeded in sense of incorporating into other processes that are depending on it. Besides I will try analyzing my own working methods on how they affected development performance.

1.1 Description of the Company

The company that I work for today operates mainly in the healthcare industry across different countries. Even though the company is considered mainly a manufacturing company with a business-to-business model, it is also developing software products and services alongside its core business for other businesses and organizations. The department that I'm working at is rather small in scale of the whole organization and is mainly concentrating on providing to customer organizations specialized software solutions in its own modality. The company has

traditional divisions of departments like engineering, marketing, sales, delivery and service departments.

I am working in a solution delivery department that involves about 50 people that work closely together, mostly remotely from different locations in different countries. Most of the work is done via remote connections whether externally or internally within the organization's own network.

1.2   Working environment

The working environment is a hybrid of being in the office and home-based, but it is not forced on any of them. As my department is spread across multiple remote locations all job operations are remote. There is a local office where everyone can go and choose a free table to work and can interact and hear each other's discussions while working. It entails some problems behind, like how to organize calls and meetings without disturbing other colleagues but also possibilities like sharing information faster. In the past, being in the office, it had brought me possibilities for doing job activities faster via ad hoc discussions, sharing information and brainstorming new things within the local team. In any case from both locations, in practice, job activities are done remotely via computer.

As my current job activities are not targeting only the local country, I have organized my own job for the last two years to be remote based. This has brought challenges in organizing cooperation and how to keep in contact with local and remote colleagues. For these I have regular remote morning meetings with local team related activities and separately for remote team related activities. There are also meetings purely not work related whose idea is to replace normal office atmosphere while being mostly remote office. In overall home-based working has worked well for me for then current position.

1.3   Organization of work

In context of organization structure my job role relies in delivery department. The delivery department is responsible for delivering software solutions and services as a whole solution as sold by the sales department. It can be stated that almost all work is related to some customer as cost unit. Therefore, each work is precisely tracked and associated to specific sale order number, SO-number, in time management system. There could be multiple ongoing projects in parallel, big and small ones, which could last over many years long. On other hand they could be hourly billable deliverables provided as consultations or product tailoring's like changing some reports behavior or modifying current integration, which is also software solution itself that enables communication between different software's. As a worker this requires good planning skills of own time and the possibility to work on many things in parallel as the context of the day can be very different.

Usually all starts from project planning with project managers. Responsibilities on project deliverables are assigned to specific working weeks where I need to organize my own activities to fulfill the deadlines marked in milestones of the project. Scriptable objects are part of those deliverables. From my side it works well in the sense you have freedom to decide what to do in which order and it does not go into micromanagement at project manager level. As time is tracked with adequate software automatically also the project planning is planned with own tool, project planning tool. All weekly activities are regularly reviewed at project and team level. As conclusion I can say that work is highly segmented on tasks and highly structured in sense of monitoring time usage. As projects and plans are very important parts, work is organized around weekly plans. They are reviewed every week, but every day is very different, and the initial plan can change very quickly.

As all is done remotely, I use daily video conference software, in our case Microsoft Teams, to communicate with stakeholders. Remote activities are done via VPN (Virtual private networks) and RDP to the customer and companies' environments. RDP is a software protocol that allows computers to connect remotely in a graphical manner. The organization of the work I described will significantly affect my work as a subject matter as I need to do it in parallel to other projects.

1.4   Professional terminology

In the delivery department everything is mostly related to some project. My projects are software solution delivery projects to other organizations. Projects are led by project managers, or shortly PM. My communication entails terminology of project management, service management and software development terms. I have project startup meetings, project milestones and go-live decisions meetings as regular activities. Every project usually starts as a consequence of some of the tenders that the company has won. Tenders entails itself cooperation with sales department and evaluation of our product features against customer requirements and assessing risk management. As consequence of risk management, it whether go or no-go decisions to the tender participation.

Our deliverables are software solutions, integrations between the software systems, reports out of them, scriptable objects run by host application and lastly configuration work around them. Any work outside of the tender comes from the customer and is usually initiated by officially requested in customer relationship management software (CRM), which in our case is Service Cloud. Via CRM company tracks our incidents, service requests, product enhancements request. With the help of CRM software, the company is getting regular feedback from customers with NPS score, Net promoter score. "NPS is an important indicator of the strength of your brand and its value to your audience as it demonstrates how likely

someone is to recommend you "(Atherton 2023, 153) Based on CRM I could get also statistics out of our deliverables like, error rates, deployment time and uptime.

Work is considered processes orienteered and highly regulated by them. A process is a set of interrelated or interacting activities that transform inputs into outputs. (ISO 9000:2000 clause 3.4.1). For any kind of output request the company has adequate process with associated procedures and work instructions whose relationship is described in Figure 1. This makes process a high level on what needs to be done and procedures and work instructions who, when, how and which tools to use.
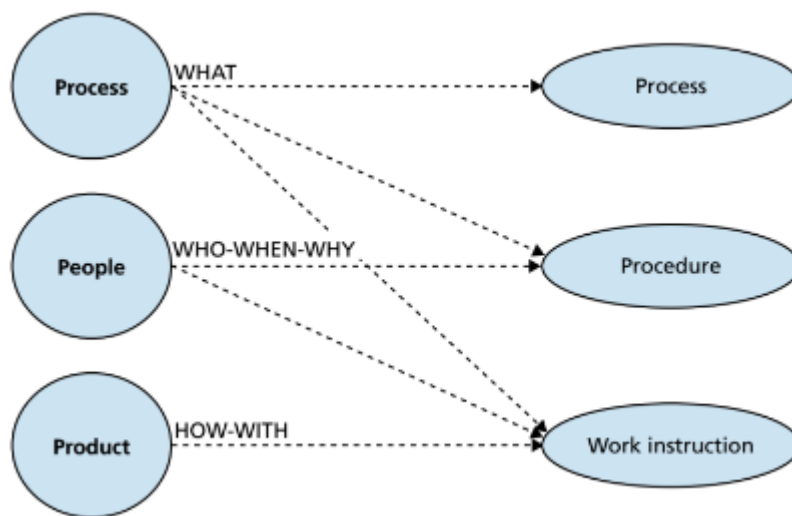

Figure 1: Process and depended on procedures and work instructions (O'Loughlin 2009, 138)

This considers external and internal activities of any personnel. And usually before something is started, I check whether there is a process. If there is not if and it is in responsibility of mine, I start a new process design procedure discussion including the work instructions design. As the process amount is big there is always retraining of the personnel. Also, I am involved in designing new processes that are mostly created by following certain methodologies that align company policies.

In context of subject matter, actual scriptable objects development, there are phases like specifications with subject matter experts, coding, documentation, code review and testing. The code review is done as part of validation phase on script development. Validation consists of checking that all is present for scriptable object deployment, like specification, test protocol. I will use frequently these terms and they can be considered as procedures and work instructions in context of process administration.

1.5   Process culture

The company that I work for constitutes process culture in the sense of everything is regulated via processes, and it uses Six Sigma Principles around it. The Six Sigma, originally rooted in manufacturing (Gupta 2005, 1), posits that all business processes can be measured and optimized, with the overarching goal of eliminating defects and minimizing variability (Harry 2010, 1). Although traditionally applied in manufacturing, Six Sigma principles can also be effectively applied in software development, where quality is important (Bansal 2010, 355). As new processes should align with this philosophy, this adds important requirements in subject matter analysis and my own activities should be aligned against company process culture.

2   Starting Point

2.1   Current Work

In my role as an Integration Specialist at Company X, I have been deeply involved for many years in designing specifications for integrations, developing business intelligence solutions, scriptable objects and creating tailored solutions for our customers. Currently a significant aspect of my work revolves around serving as the Scriptable Object Community Leader, where I am tooling and processes owner, including validation processes.

For the scriptable object administration, I ensure that all team members follow established procedures and utilize designated tools effectively. This involves maintaining the integrity and efficiency of the scriptable object development process by overseeing validation procedures and enforcing compliance with established standards. Additionally, I act as a point of contact for addressing any issues or concerns related to tooling or processes, facilitating communication and collaboration among team members to streamline workflows and optimize outcomes.

One of the notable issues involved with script objects is that they rely on an application that gathers real-time data from various sources and that scriptable objects are executed within this host application real time on this data. With a large installed base and extensive configurability of this host application, scripts offer significant functionality variability to the whole solution. My role includes ensuring a comprehensive tracking process to monitor deployments, ensuring that all stages of the process are carefully documented to meet quality process requirements.

The scriptable object itself is a unit of executable code that can be executed within various programming environments. It serves as a container for a specific functionality or task,

capable of processing input data, producing output data, and interfacing with other components of the system. Scriptable objects may have different launching mechanisms, including direct button invocation, event-driven triggers, or scheduled execution. Their life cycle is usually many years or the equivalent to host product life cycle, which can be tens of years. Additionally, scriptable objects can vary significantly in complexity, ranging from manipulating to single input variables to up to hundreds of different variables. Analogy of scriptable object could be described as SQL Triggers and host application being as database itself or PowerShell scripts and operating system being as host application, but in this case the solution is propriety.

Due to the host application's high degree of configurability and the potential for local alterations to script instances, minimizing deviations from the intended behavior is crucial. I am currently involved in developing new processes for creating scriptable objects to be more automated and standard. In parallel I work with other projects that may be directly or indirectly related to subject matter. They may be integrations, analytics development, or internal development processes and weekly booking could be rather tight due deadlines and therefore it plays a crucial importance not only prioritizing own activities but also keeping other departments up to date, therefore despite of project level prioritization there should be also efficient own time prioritization techniques to achieve the targets.

2.2   Earlier experience

I have been working as a system integration and business intelligence specialist for over 10 years in the field. Also, I have worked as a software developer. For 10 years I have done numerous integrations and software solutions that have automated workflow of the data between different propriety systems. Also, I have done many analytics solutions from bottom to top, from creating low level ETL, by extracting, transforming and loading data to some Datawarehouse solutions and eventually implementing key performance indicators through analytics system of customer choice. Though deep knowledge of my programming and scripting skills and subject matter expertise will be required in administration scriptable objects, I see this project more beneficial in context of business administration or process administration. Also, I am ITIL certified. ITIL, or Information Technology Infrastructure Library, is a global framework designed to help improve customer experience and promote best practice frameworks and methods for IT professionals in IT service management (Persse 2012, 7).

2.3   Stakeholders

As my own work is very project orienteered, I need to cooperate with many different people that hold different roles project to project internally and externally. Projects are usually associated with certain companies or organizations as business models operate in Business-to-Business principle. As work is related to software solution delivery and getting this software to communicate with other software's of the customers, in projects there are business representatives from both counter parts with roles like integration specialists, application specialists or project managers. Applications specialists here from both sides' server as subject matters experts of how software or solution could be potentially used.

Main stakeholders' customers which usually companies or organizations themselves. are project managers (PM), applications specialists (Apps), integration specialists (IS), business intelligence specialists, customers, subject matter experts and regulatory. In Figure 2 I presented these graphically.
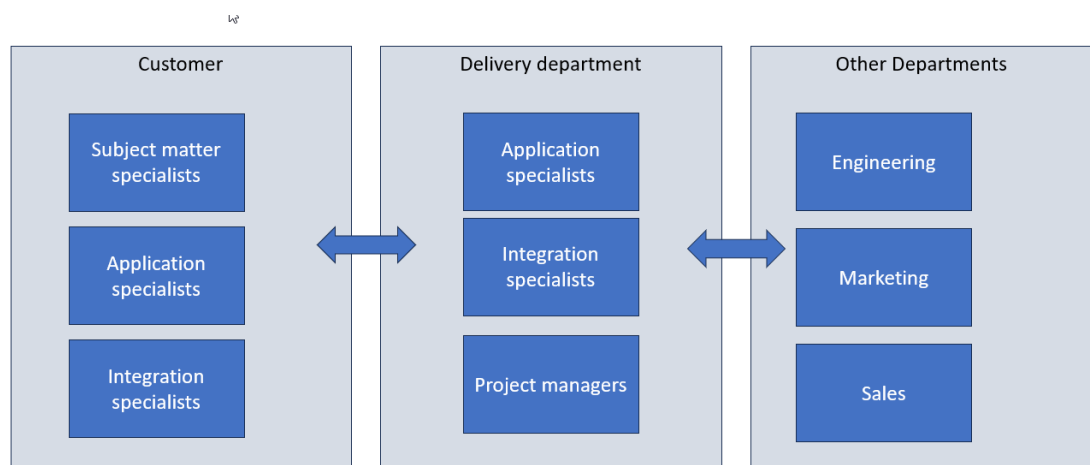
Customer	Delivery department	Other Departments
Subject matter specialists	Application specialists	Engineering
Application specialists	Integration specialists	Marketing
Integration specialists	Project managers	Sales

Figure 2: Stakeholders related to the subject matter

2.4   Communication skills

I especially recognize the fact that in rather big projects not only own skills matter whether they are technical, or administrative but also big importance should be dedicated to communication. It can be stated that times, when one expert or researcher performs all the work on problem statement or does the whole development cycle alone, are in the past. Now all projects start to rely more and more on the previously learned data and data becomes more and more complex. It could be stated that all new developments will require more involved experts from various fields and therefore more time to achieve any measurable goals. Therefore, with increased amount of subject matter expert needs it will require more resources not only manage but also more knowledge to do precise communication that is

straight in the context. As any expert's work is measured by his used time it is very crucial to be very precise in our own communication but be also a very good listener to the customer's needs. Taking into account that every has their own starting points and may have their own cultural backgrounds it becomes rather crucial to have not only good communication skills, especially when customers but also aware of different ways of working around the world. It might be stated that communication skills come from experience from other projects but also it comes from the attitude that the customer is always determining our success. Therefore, first it is first to align own communication practices to be first a listener of customer of any kind, whether it is internal or external customer. It could be considered that any part of the project should start by applying VOC or voice of the customer. It includes collecting Current Challenges, Desired Improvements, Stakeholder Input, Insights via different methods (Ehrlich 2002,45).

I acknowledge that process design success relies on the communication skill of all counterparts and how process owner is able address the lack of communication between different stake holders that are involved in different parts of incorporating of the process. It can be that something is not happening that somebody is just waiting instructions, or somebody assumes something and then it just waits in the air until issue is becoming escalated to upper level. Therefore, it could be beneficial to have regular meetings even if nothing happens just to make clock synchronizations. On the other hand, the biggest point of pain could be the handover of deliveries to other teams. It may include moments like hand over of scriptable object from developer to customer deployment and next of its service desk maintenance activities. It will require training of the customer, training of the service desk.

2.5   Goals

The goal of this thesis is to develop the process for managing a large installed base of scriptable objects. The goal of the process is to streamline and standardize their administration across different departments in one organization. By implementing this process, my objectives include reducing deployment times, ensuring uniformity, enhancing quality, and improving user satisfaction throughout the scriptable object lifecycle. Given the complexity and time-consuming nature of the subject matter, I will focus solely on establishing the process using one of the commonly employed process design methodologies and associated tools which may incorporate changing or creating new procedures or work instructions as part of the process.

2.6   Challenges

As improving or creating new processes affects existing process performance, whether as input or noise, performance of changes should be considered as whole, if possible, from integrity of all processes point of view. This requires from my side knowledge and experience

about the company's other processes and working culture involved. I have analyzed which approaches or methodologies do exist already to make the design process structured manner in context of existing company culture. As the task itself is in the area of software development or service management, I reviewed whether some agile, lean, or ITIL techniques could be applied. But given that our organization's utilization of Six Sigma principles in manufacturing and other business processes, it was logical to select a methodology provided by Six Sigma. For the development of a new process, I have chosen technique is DMADV (Define, Measure, Analyze, Design, Verify), a Design for Six Sigma methodology extended for developing new products or processes, with a strong emphasis on quality and customer satisfaction (Tennant 2002,173). DMADV methodology that I will reference during the work could be described with Figure 3 diagram that I have compiled based on the definition (Voehl & Harrington & Mignosa 2013, 187).
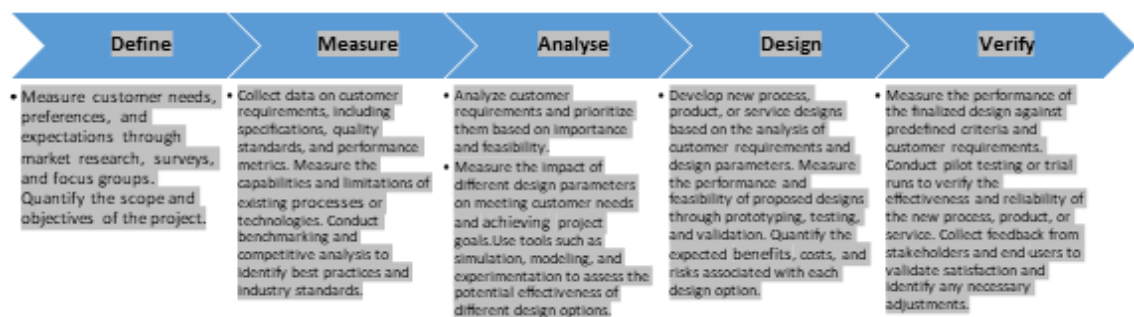

Figure 3: DMADV methodology based on (Voehl &Harrington & Mignosa 2013,187)

The Define part actually follows the same goal as the goal of this thesis which is l is to streamline and standardize the process of administering scriptable object installations across our organization. I have already organized the collection through meetings or other forums user requirements across stakeholders which can be called as hearing Voice of the Customer (VOC) part of Define phase. VOC or Voice of Customer is an important umbrella of tools of Six Sigma define phase, like surveys, focus groups, interviews, complaints and so, to ensure that customer importance is guaranteed (Tague 2023, 30; Ehrlich 2002, 45).

In Measure phase I will try collect what is measurable and then analyze it in Analyse phase with commonly used approaches by DMADV methodology. While the initial requirement for Six Sigma is measurability, which can present challenges in software development (Reifer 2006,224; El-Haik & Shaout 2011,196). Particularly in the context of scriptable object administration in my case, I will explore actions to make the process measurable and incorporate measurability from the outset.

In Verify I will conduct verification of the process and proceed improving or tuning it parts it to become complete to the expectations. Here I could rely on some agile and lean technique to make fast tooling changes or reduce waste in process. Lean is one of the methodologies that optimizes processes by eliminating waste and increasing speed and flow (Goldsby & Martichenko 2005, 4). "Lean and Six Sigma methodologies differ in their approach regarding the source of this waste. Six Sigma focuses on process variation, whilst Lean concentrates on flow through value added and non-value-added process activities." (Jiju ed. 2020, 103)

Recognizing that Six Sigma emphasizes continuous improvement and customer focus all the time rather than static creation, I will propose tools and workflows to facilitate ongoing enhancement and measurement of the process. Given that this process will operate alongside others, it must seamlessly integrate into existing workflows. It is acknowledged that Six Sigma methodologies may entail more time compared to commonly used methodologies like Agile and Lean in software development. I will evaluate whether this additional time investment is justified in achieving the desired outcomes. Also, one important thing is to consider those things that are not measured at all usually are not getting improved (Badiru&Bommer,15) or even managed (Kerzner 2017 ,91). To really improve things, they should really become measurable directly or indirectly.

On top of these I need to find balance with this process development, running process older obsoleted process version and migrating to new process workflow that will be incorporated in steps and lastly fulfilling other projects deadlines. It may entail more pressure than the problem topic itself.

2.7   Baseline of the process

In this chapter I will describe the current status of the process and prerequisites that have been done before moving to diary phase. In Figure 4 I have described the processes' current state as SIPOC diagram before applying the new administration process. SIPOC diagram can be used to describe the current state of the process at a high level. SIPOC stands for Supplier, Input, Process, Output, and Customer (Tarantino 2022, 61). In this case the process flow is quite straightforward. But the problem lies in the fact that the process could have been followed simultaneously in parallel by multiple different departments causing deviations.
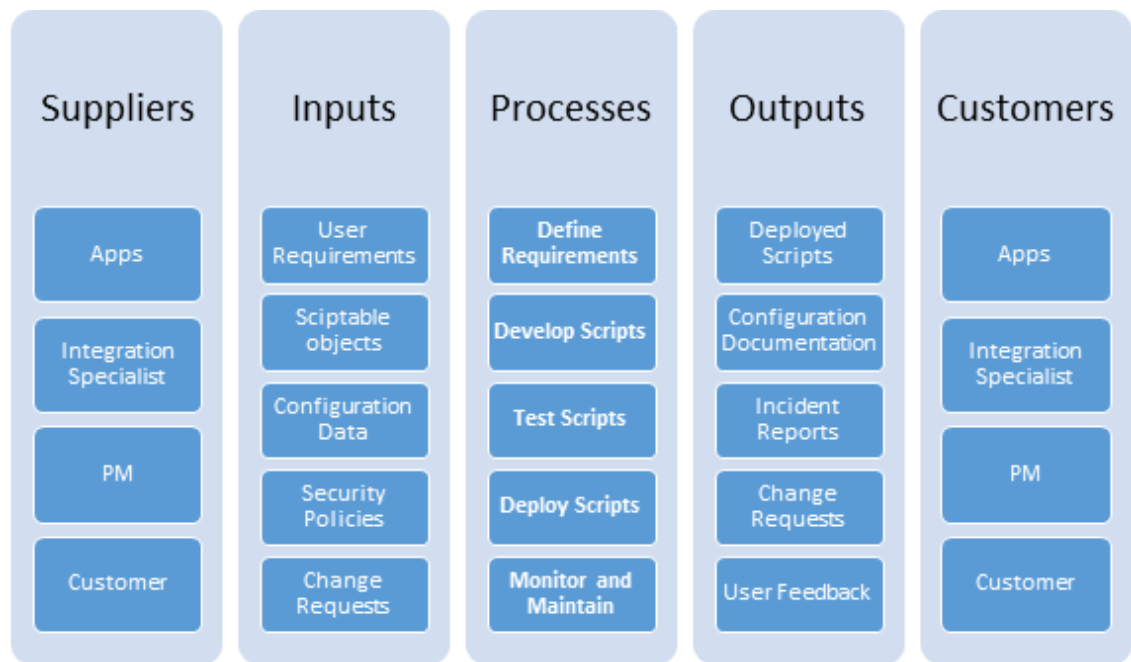
Figure 4: SIPOC diagram about the process

Additionally, as early findings of Define phase, I have identified customer requirements regarding scriptable objects through different feedback sessions and meetings (VOC). They are shown in the customer requirements column of Table 1. In column "Technical Requirements" I presented also design characteristics associated to each customer requirements and prioritized them.

Table 1: Customer Requirements and Design requirements

Customer Requirements	Technical Requirements	Importance Rating
Fast and reliable deployment	Standardized script templates	High
Consistent and error-free execution	Error handling and logging mechanisms	High
Easy to understand and use documentation	Comprehensive documentation	High
Flexible and adaptable scripts	Modular and reusable components	Medium
Secure handling of sensitive data	Encryption and access control mechanisms	Medium

These are actually characteristics of the scriptable objects rather than process but as my goal is to standardize administration it makes sense to projects metrics to the scriptable objects rather than process phases at this stage. There was also done lightweight inventory actions across installed base of existing scriptable imported into central repository which I will call in future as scriptable object library. Later I will discuss metrics associated with process performance. In the following chapters I will describe my work in diary format and show other parts of the development process for administration scriptable object installed base.

3 Diary reporting

3.1 Week 1 04.03.2024-11.03.2024

Monday

I started the day by code reviewing two types of scriptable objects. One part of standardization is to find common use scenarios and incorporate them into one code template. With script type I characterize scripts that share the same behavior or use scenario or user definition but may have different code base. I call it deviation in terms of Six Sigma and my target is minimize it. As I stated in the Design characteristics idea is that scripts are modular and template-based solutions where customization should be limited only to input parameters. I decided to create a separate code library that will standardize commonly used code patterns. Also placed best practice approach to the scriptable code definition structure to have strict input code block, logic block, output block. I call this code refactoring which aims to make code clearer and more modular. Code refactoring is to make code easier to read and cheaper to make changes in future without changing observable behavior (Fowler 2018, Defining Refactoring). I will initiate a lot of code refactoring in future. Main note of day from my side was on code refactoring.

Tuesday

I had a meeting with a colleague whose project A also shares the same scriptable objects deliverables. I explained the code library approach and refactoring's done by me. After, I had other meetings with one project manager and application manager that had also similar scriptable objects deliverables on projects B, and C. I have requested for this meeting as early review of the project to make early recheck of the deliverables and introduced that scriptable objects shall have revalidation as part of this new process before delivery. For me revalidation here just means that scriptable objects are checked additionally against new process requirements as part of documentation and standardization of the scriptable object. Aim is if I could incorporate some changes early into project roll out.

In weekly project planning tool for this week, I had another project F assigned with similar deliverables so I decided to synch the work as it will be easier to find best template solution while checking requirements and configuration from multiple projects. For scriptable object administration I planned for myself to make early involvement of other projects at planning phase. Planned to send mail to project managers to remind of that projects should have early identification of scriptable objects deliverables. I had kept meeting as scriptable object leader monthly review meeting with technical persons. I have decided to use it as a code review meeting again and as a training opportunity for scriptable object use scenarios. From my side the main note of day was on process visibility within stakeholders.

Wednesday

One important thing of the analysis phase is to get everything gathered and analyzed. From scriptable object point of view, I need to have them all collected into the central repository as part of Measure phase (DMDAV). I have previously created an inventorying tool. Inventorying tool is basically asset management tool. It works by assigning for each scriptable object a unique global object identifier, OID. OID consists of branch unique path identifier and branch identifier, and it is used as object identifier that uniquely identifies schema object (Desmond & Richards & Allen & Lowe-Norris 2013,75) OID allows me to keep track of what is installed and where. This way the whole install history of scriptable object can be tracked. For me it will become one of the important tools of analyzing phase of DMADV methodology as this will translate each scriptable object into physical asset that has tracking number. This will also add to me the visibility to me as process owner what is installed and where.

Sent email to stakeholders that projects delivery initial list needs to update for the projects. Meanwhile I proceeded with library code refactoring for two scriptable objects. During this I have identified some issues with code that needed double checking with other colleagues. Asked colleague to do formal test by following test scenarios.

Had sent a summary for project A so that two scriptable objects can be tested. Half of the day went with other not related to this process. By the end of day realized that it seems to get 2-4 template types to be standardized but it requires to check against few projects. On the plan I have at least two projects alignment on scriptable objects. From my side the main note of day was on inventorying scriptable objects.

Thursday

 I had almost a two-hour meeting regarding projects B and C scriptable objects deliverables. I clarified open lists on these deliverables and where the standardization is ongoing. We went through the whole configuration and activities needed on them and over all status on them. I

decided that application specialist will collect some prerequisites research about use scenarios. There is some deviation on use scenarios regarding project A, C, D not only on config but also on usage. I decided how we proceed with splitting activities on who will do what and recheck next week on how to proceed. Also noticed that there should be more meetings as stakeholders seem to be unclear on responsibilities. I consider this process should get more visibility withing stakeholders. I have had additional meetings with stakeholders and the deliverables list needs clarification. Basically, the day went between one project A and scriptable object administrations for 6 scripts in parallel. Most of the scriptable objects were merged to use code library functions. Code has significantly simplified and is more readable. I agreed that template is valid for serial installation as template. In parallel there in horizon plan validation process for standardized scripts on projects D, C. Also, I got a validation request for go live for one go live project which I have prioritized to be done next week. From my side the main note of day was on visibility of the process and sharing the information.

Friday

The central catalog of the scriptable needs to be always up to date. It is updated by inventorying tool updates and manual user inputs. I have done Central repository as separate SQL database. For example, time to time naming are not identical and same intended scriptable objects are not linked into same use scenario. Using it, I find it scriptable objects that are similar and after personal analysis link them into same group. All reviews and validation status checks I will store in this central repository for all scriptable objects linked to its OID. It will automate dependency checks automatically as all scriptable objects are stored in one place and with structured metadata that is searchable. Via centralized repository I can scan for similar scripts and group them together and find templates patterns and what can be extracted as separate library function. During the first week the library grew by 10 functions. And 5 different scriptable objects have been using it. In summary I am analyzing the phase of DMADV methodology. During the analysis-phase I find what can be improved and using early lean interventions to administration process I start change working procedure and instructions. From my side the main note of day was cleaning central repository.

Week Analysis

Scriptable objects development could be considered as mass customization solution. Mass customization could be described as a business strategy that aims to provide customers with tailored deliverables at near mass production efficiency (Blecker & Friedrich 2006, 12). Here mass customization can shorten the time to deliver products or features to the customer (Pries & Quigley 2012, 274). My goal is nevertheless to minimize overall deviation of scriptable objects keeping quality in priority. Also, as part of Table 1: "Customer

Requirements and Design requirements "scriptable objects should have specific requirements. On the other hand, modular design is prerequisite for mass customization (Pries & Quigley 2012, 272). So, this week I fully concentrated on the installed base analyzation and doing code refactoring of the existing scriptable objects. Here I have targeted to make them more modular and reusable as part of reusable library across scriptable objects. It also serves to minimize deviations in the terms of Six Sigma terminology. It required me to make analysis of a big number of scriptable objects and find the optimal solutions that will still fulfill the initial user requirements of the script. It had challenges in the sense that it took more time than I expected. Also, it had put pressure on own time usage like which things can be done by own, delegated or postponed to following weeks. But currently as my target is to analyze current status of the scriptable objects, measure their deviations and find bottlenecks in process of administering them, I have minimized delegations. In sense of DMDAV methodology we are in measure and design phase. Here I try to collect information about scriptable objects and do design changes on them also as I try collect the stakeholder's awareness of the process visibility. Besides, I had challenges that some stakeholders had different vision of how it should work. In overall current process is as described SIPOC diagram in Figure 4 will be extended with code review and refactoring phase during delivery phase and here crucial role will play up to date installed base catalog of the scriptable objects.

At this stage of the process development, the process is hybrid mode of using old approach, as described in SIPOC diagram and new approach where I incorporate standardization step so that I get more visibility and make adjustments on the go using lean approach. On the other hand, these early meetings promote visibility to stakeholders and could make perception of the process easier (Slack 2009, 146). Later I need to concentrate on process visibility within stakeholders.

3.2   Week 2 11.03.2024-18.03.2024

Monday

I had weekly planning meeting for week priorities. One of the activities is two new scriptable objects request. I have identified templates that can be used from the existing installed base, and they will follow the new validation process. I had a meeting on project A with the application specialist. We have reviewed documentation needs and how tests should be documented. I had generic meetings with stakeholders of default project deliverables in context of scriptable objects. Then I had activities on a project that has some go lives activities, which took 80% of the day. I planned to concentrate in context of the scriptable object administration rest of the week on analyzing the installed based, doing code refactoring's where needed, ensuring that correct templates are used for scriptable objects,

documentation and test protocols. From my side the main note of day was another project go live activities.

Tuesday

I have asked a colleague to make functional tests of a new template for one use scenario on test system. "Functional test is a quality assurance process based on black-box approach that aims to provide a proof of implementation correctness regarding to the specifications of the software under test" (Bondavalli & Ceccarelli 2014, 235). A colleague said that on test system use scenario is implemented with different scriptable object template and I have put it on hold. During the day I asked another application specialist on the same topic, and I was told that on another environment template I proposed should be used, nevertheless. I asked a colleague to retest the initial proposed template. I have already noticed before that same use scenario can be implemented with different scriptable objects template. This makes the initial problem statement more difficult and requires me to have more manual use scenario reviews whether two scriptable objects can be merged into one template. Planned to have a meeting with applications specialists on this topic next week. From my side the main note of the day was follow-up of tests of specific standardized templates.

Wednesday

 In catalog repository I need to handle the metadata for each scriptable object and keep track of each scriptable object. I have realized current header of the scriptable object should be extended with more metadata details so that scriptable objects become signed entities and they can be tracked not only by their OID but also signed hash of the content and validation hash. I have added simple functionality that allows automatic code signing on batch of scriptable objects. "Code signing is to ensure code integrity, to determine who developed code, and to determine the code's purpose" (Abernathy & Darren & Hayes 2022, Software Protection Mechanisms). It will also help to identify if there were changes made to scriptable object definition outside of this validation process. This was needed as the scriptable object library has grown too big as inventorying tool has been run across many projects and it is hard to track unintended changes. I had a two-hour meeting on scriptable objects deliverables with managers, sales and project managers. From my side the main note of day was adjusting signing header of the scriptable object to meet new requirements for code signing.

Thursday

I had a follow up meeting with a colleague with how scriptable objects are for project B and C. Tests are still ongoing. I have realized that there is a mismatch on the structure of the folders of how documents need to be saved. Common path I have agreed is region, project name, scriptable object type. These documents are then used for validation and part of code

signing. There was an incident in Service Cloud regarding scriptable objects. I had a meeting about it, and we decided on availability that other colleagues to look at it. From my side the main note was ensuring that documentation was kept according to work instructions and there is planning to write new work instructions on where documents should be stored and with which naming conventions.

Friday

I have identified that I need more automated tools for scriptable objects validation and signing as I mentioned that installed base has grown very big. Doing it manually will not have enough resources. I have used this day to create extended tooling where I can see all scriptable objects of every project and their signing metadata and whether scriptable objects have some deviation from code signing and metadata hashes. I have tested this new tool on a few projects and based on the tests it will save a lot of time. Here I made a review of project scriptable objects, their documents and that they are correct. I batch code signed scriptable objects and copied sign header to the project deliverables. Made test on project level and verified that tool identifies unvalidated changes of the code if they were present. Besides it in single view I can see what lines of code deviate from the standard template for each scriptable object and do plans of next actions. From my side the main note of day was aligning process helping tools to be more automated as these tools we main procedures of administration process.

Week Analysis

Overall week was about getting visibility of scriptable objects deliverables within stakeholders and getting stakeholder's aware of what new standardization process is aimed for. Within different meetings and communication, I have identified that the current process status (Figure 4) is not known yet for some project managers also as our scriptable object deliverables may not be clear for all counterparts. Also, there is a need for clarification of the need for stricter documentation requirements that this new standardization process follows. Therefore, I have decided to concentrate on having early intervention meetings with project managers and applications specialists to increase visibility and understanding of the need for the process already during the planning phase of the projects. Process visibility will benefit process owners at design and runtime and allow continuous discovery of new opportunities for improvement to collaborate across enterprise (Dyer 2012,7). Also, visibility will increase stakeholders' perception of the process (Slack 2009, 146). I have also planned to have some more review meetings in context of some project additionally arranged. To support this, I have also created some simplified visual process maps and work instructions for some parts of the process.

The other topic of the week was automating and enhancing the tooling as during this week I have realized with process simulation that with current tooling there will not be enough resources to maintain the process in an efficient way. Process simulation can help to make estimation of process efficiency before rolling it out. For example, whether the process will become queued if the process is not efficient enough. On other part I need to recognize that there are limited resources dedicated in the standardization process and all cannot happen at once and the process will need to be continuous effort. If there is not enough time, or too strict deadlines for deliverables or resources then we need to cut scope or quality. That is presented by the time management triangle in Figure 5 (Bainey 2004, 319). Therefore, it is crucial that base ground of scriptable objects and tooling is done adequately to minimize time efforts for implementing design characteristics in Table 1 and running the process. To control time and schedules I have also decided that will do standardization in phases, few scriptable objects at time.
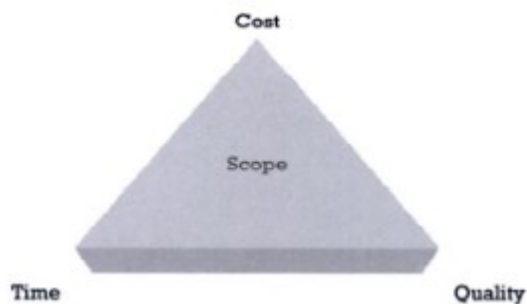

Figure 5 Time management triangle (Bainey 2004, 319)

I have also identified that there is a need for strong tooling, that will automate all what is possible so that deviation can be tracked easily. That I have implemented batch code signing and batch recognition if code signing is violated by any unpermitted changes. Code signing will help me to ensure code integrity, to determine who developed code, and to determine the code's purpose (Abernathy & Darren & Hayes 2022, Software Protection Mechanisms). As I have automated it, it will not require manual reviews so much in future. Also, I have planned to incorporate key performance indicators, measures, to track how many scriptable objects have been created following the new validation process. I created new targets to achieve for them in the following months. One important thing is to consider those things that are not measured at all usually are not getting improved (Badiru, 2017,15). Overall, I place as target that all scriptable objects will become code signed via this process eventually.

3.3 Week 3 18.03.2024-24.03.2024

Monday

I had a meeting with an application specialist on one scriptable object to clarify some logic as it was not complete and was conflicting with logic that could be found on open sources via Internet. It is important that specifications are clear during definite phases, and they are possible to cross check from different sources. I Asked application specialist to clarify. On other meeting with other colleague, I showed previously developed batch signing and project overview view. I asked a colleague to go through the inventorying process using this new view and received good feedback. Asked him to use this project view for further documentation as then all will be in one place also as it will allow measuring of the progression of using new process. And I consider measurability of key point of the process.

Tuesday

I had a meeting with a colleague to synch on scriptable object library code changes. I needed to make some changes to input parameters. We had initially a different approach to implementation but eventually it ended up as I proposed as the solution was more modular and less changes needed. I also recognize that at this stage there is no time to make any big changes anymore as one change usually launches cascade effect to do changes other parts. Nevertheless, I also found that some changes still needed to be made and I delegated it to a colleague. As I had some time pressure on some other projects, I postponed some meetings to the end of week.

Wednesday

I had a meeting where I asked the application specialist to retest multiple scriptable objects on test environment but got reports that results failed. When I checked the errors, I realized that I assumed based on discussions it was already tested before by another colleague on another environment. Eventually it was revealed that it was not tested to the end. There was a misunderstanding about what had been tested. Eventually I made the needed changes, but it needed more time. This considers that I need have more status checks what have been really tested.

Thursday

I asked a colleague in Teams whether the other parts were done as agreed. Due to other project deadlines, he did not have time and informed me that he will do it later today. Meanwhile, I had overbookings for this day in weekly planning and it took some time to resolve those. In the end of the day had made cleanings in one test environment for scriptable objects and used new project view to list and batch sign scriptable objects. Using

it I created a status report for the environment. As this new view will be used in the future quite a lot by different people, I needed to test myself thoroughly. View would allow to monitor progression for statuses of scriptable object delivery for each project and to ensure that all needed documentation is up to date and trackable afterwards if some parts of the documentation change.

Friday

I asked a colleague whether the changes were made. It was revealed that they were not done. I agreed that I will proceed making changes on my own as there are tests pending on these changes. There is overall time pressure within the team this week.

I had a meeting with application specialists regarding the new validation process and explained to them new requirements for the documentation and where and what are the needs to be saved regarding the documentation. Explained the motivation for the changes. It is one of the important meeting series with applications specialists to get more visibility and applications specialist trained to new requirements. Also, to get a new meeting place for reporting issues with scriptable objects. Based on meeting outcomes I created a new work instruction document on what and where needs to be documented as process definition.

I had a meeting on a project regarding a scriptable object. There were a lot of changes requested by the stakeholders. Stakeholders reported that initial requirements are not fulfilled in context these requirements but when I raised existing documentation and test document files, these documents confirmed that all works as should. This emphasizes the importance of up-to-date documentation with clear definitions.

Week Analysis

I proceeded this week with different projects scriptable project delivery, improving tooling, training new colleagues on new features on process supporting tooling. I did some refactoring's of the scriptable objects, but changes were minimal and more based on feedback from the tests. Some approaches now will not allow anymore big changes due to retests needs following them. As there were some time pressures on other projects, I needed to do these between the other project activities. Time pressure did concerned also colleagues involved and that affected the time planning. Due to time pressure I needed to postpone some meetings to Friday. That is quite usual for all kinds of software developments and needs to be considered when planning deadlines. And here also impacts previous time management triangle concept like changing costs, time, quality affects each other, but also own planning skills.

I have extended pilot testing of the batch signing tool with three different environments. I got feedback from one colleague and the results were promising where special note was that it is fast. In the end of the week, I have devoted time to review the process flow with new validation requirements, documentation repository structure to use with application specialist. I have gone through some hands-on training with them. The idea with these early hands one training is to get early feedback from stakeholders and make agile adjustments on the go. Then I plan to get more stakeholders involved in the new process so that across the project we follow the same folder structures, same work instructions and these regular meetings will help it. For work instructions I have created separate files like Documentation requirements work instructions. Inventory requirements instructions.

During this week I also got confirmed the importance of having up to date specifications for the situation whether project deliverables are fulfilled. Therefore, the planned validation process should ensure that documentation and tests documentation are up to date and here clear documentation archive helped already with some conflicting situation. Documentation should be compact and clear and specially up to date to minimize maintenance issues (Rohit 2010, 284)

Next week I have requested an inventory meeting where I will explain steps for inventorying installed base. The idea is to retrain stakeholders and make it more self-adjustive so that I do not need to make push requests to refresh parts of installed base separate. There will be dedicated responsible people that will do it on a regular basis. Idea that I will update work instructions and RACI for this. RACI is responsibility matrix where it provides responsibilities for given task and provides easy way track who does what during the process (Morris Gallacher 2006, 1060). From RACI point of view, it is still under consideration who will be using this new project overview that I developed earlier, let's call project overview view further on. There are some fields that need to be entered by different stakeholders and that need to be clarified in future whose responsibility it will be.

3.4 Week 4 25.03.2024-31.03.2024

Monday

I had a weekly planning meeting with project deliverables as usual. Then I prepared presentation materials for inventorying workshop meeting where I idea was review with all involved colleagues the status of inventorying of scriptable objects installed base and what are next actions. We have reviewed the current RACI matrix of the ongoing tasks, target projects and what future steps are needed in context of inventorying procedure. I have agreed which people are responsible for each project. I have created separate work documents that collogues can follow as part of the process. From my side this is one of the

important procedures of keeping installed base up to date and needs be handled autonomously by whole team and therefore it is delegated.

Tuesday

I have proceeded with the day by adjusting scriptable objects code library. Last week there were some leftovers that I did not manage to realize last Friday. I have asked application specialist B whether these latest changes can be tested by him for project B as other application specialist C was on vacation, but I was told, that due internal agreements, it should wait application specialist B coming back from vacation. I expected that I could also use other application specialists for these tasks. I have contacted the project manager about the situation and was informed that two application specialists are on vacation and more resources are only available next week. For me this means that work on these will move next week. I asked if other things could be tested meanwhile but there is only some small configuration work that can be proceeded. This is quite of that needed resources are not available at same time and or there is missing synchronization due many parallel projects, but this is not critical for me at this point, but something to consider next time.

Wednesday

I have realized that the signing header of the scriptable objects when applying signing to the scriptable object had one extra character that caused some misbehavior. This was as consequence as previous code changes were made quite fast, and I had not noticed this obvious bug in the past. I need more patience to check these new features.

There was a service cloud incident case where project stakeholder reported that something did not work as expected. I have reviewed the whole raw data of the calculations-based data logs and actually it all seemed to work properly. There were some sporadic random abnormal values that scriptable object did use correctly by specification but for some reason stakeholder reported output as incident. I made an analysis report and sent it back to stakes holder. I have noted here the importance of clear logs and clear specifications that I have used. But this took half of my day.

I got a meeting request for one of the biggest scriptable objects that is already used on other projects. I have previously standardized it and was doing work instructions on how it could be serialized for mass use. I have sent work instructions on what needs to be done to apply this template to another project. I think I will organize separate meetings on this template. For me the Importance here, is that request went correct process request and correct template was identified.

Thursday

I had meeting with colleague where all last week changes and Tuesday changes I did so that he can synchronize those for project A. We have gone through the planning excel for the project and ensured that correct steps were done, and correct test were applied. We have reviewed a few scriptable objects that were done in a project specific way. I provided which parent template needs to be used for the scriptable objects so that we could follow more easily changes between parent template and derived scriptable object. I have also agreed that colleagues will use this new project view to document this information from here on so that we have it one place. For me it allows not only to see the scriptable objects dependencies per project but also track status of scriptable objects.

I had a follow-up meeting last week where scriptable objects changes were needed. I explained that deviation was due configuration deviation and not about the scriptable object definition. Then we reviewed with stakeholders the list of changes needed which were provided in the excel file. For one target variable there were over 10 different source variables mentioned to be used in calculations while the initial accepted specification had only 2. I agreed that this is a change request and requires more specification details from stakeholders. There will be multiple follow-up meetings.

Friday

Public holiday

Week analysis

I have proceeded this week by reviewing the installed base status and sharing with other colleagues what steps are expected from them so that scriptable objects installed is kept up to date. I have updated RACI matrix and work instructions with colleagues, and I hope that process will go more autonomously in future based on this workshop. For future I plan also incorporate tracking notifications that will notify when inventorying needs to be done.

Now I have delegated this to the responsible persons to do it once in certain period. This is that I could not completely control inventory process due to the big installed base. Target is also that installed base administration is streamlined with automation or autonomous delegations as much as possible to minimize wait times or waste in process. Proper delegation requires some investment in isolating the tasks itself and providing proper communication, but it allows me to ease the burden on tasks which do not require my participation as process owner. In some cases, delegation increases the trust inside of the team and could be one way of leading for project managers. (Kuster et al 2015, 231)

I have finalized changes in the code library that were left over from last week. I was supposed to delegate tests to another applications specialist, but he was booked for other projects this week and the other two were on vacation. In future I need to ask the project manager earlier if there could be backup colleagues used so that tests can proceed. This may happen that with the project manager I did not discuss clearly all steps out on dependencies of tasks. Also, it may be that the project manager did not recognize separate time control. It is noted that additional time control should be done by separate controller as project manager by absorbed by daily project actives and have slack rein on some tasks (Spiess & Felding 2008, 152).

Then I had one incident analysis on scriptable objects where everything eventually worked as specification describes. On other hand, on Thursday, I had follow-up meeting with other scriptable object incident, where we eventually agreed with stakes holder that request is actually is a change request to initial behavior. These emphases previously stated that specifications should up to date and also as the log files for this kind of situations to proof that intended use is fulfilled. It is important that documentation and service documentation is up to date as it is affecting solving incidents in a timely manner (Persse 2012, 283).

Project overview page usage, earlier incorporated in to use, has increased by three people, and I got feedback on it. I have thought about creating separate training materials and planning training for colleagues. The idea is that using this view all mandatory metadata data will be written down and when all is ready for validation status is changed to validated. Here, as earlier I identified to make the process measurable via this project overview page and so that all stakeholders could enter their own input as based on RACI matrix.

In sense of DMADV methodology, I have currently collected data about installed base state by code analyzing it and through various meetings collected how process has worked from administration point of view. As design characteristics of the scriptable objects are overall target for administrative process, I have made 5 whys analysis to find root causes why administration process earlier could end up into deviated designing characteristics. 5 whys analysis is a way of asking continuously why to find deeper root cause until root cause is found (Furterer 2016,119), usually under 5 times, as consequence I have ended up that I need autonomous inventory procedure ongoing and continuous validation procedure with continuous refactoring of scriptable object installed base. In overall the validation procedure will aim to ensure that design characteristics are met but this cannot be done without up-to-date installed base to use as reference, as with installed base I could find best suited template among many used for specific use scenario. Next week I plan to discuss with colleagues more on this project overview page and how it could be used for administrating the validation process.

3.5   Week 5 01.04.2024-07.04.2024

Monday

Bank holiday

Tuesday

I have prepared for the monthly meeting for scriptable object administration for technical stakeholders. Created some slides to summarize the current situation of the scriptable objects. In the meeting I Described current status of standardization and what project are currently ongoing and what scriptable objects are crucial for ongoing project delivery plans and asked if there is any issues or topics to discuss within the team. As there was nothing to be escalated the meeting proceeded in a normal way. I explained what minimal documentation needs are for each scriptable object, how and where the documentation there should be saved. I have reviewed the project view that I have developed earlier and explained it will be used in future as main tool to document, sign all dependent associated document to each scriptable object. It could be considered that it will be our documentation tracking tool. Main motivation was to have review the steps and having free discussion if there something to improve. As I have earlier mentioned, scriptable objects could be considered as mass customization solution, we need to ensure that we have good ground for tracking consistency of documentation, deviation from standard and also having good standard templates what will outcome from refactoring phase.

Wednesday

I reviewed some documents and plans regarding next week. Next week we have a team meeting, which happens very rarely, and it will be a big event in that sense. I have multiple presentations. Some of them related to documentation and validation, best practices. My manager has asked me to showcase one good, best practice template. I have chosen a template that could be used for 20+ different use scenarios without any code changes purely via host application configurations. I have done this template before this administration process work. Instance of the template is one of the targets with streamlining and standardization administration process. We have less templates and more parameterizations possibilities. In the slides I have described the concept and intended uses, limitations, when to use and when not. During the day I got some feedback on last week's scriptable objects. I was developing my comments and revealed to be correct.

When moving actual implementation to project environment, realized there were configurations deviations in host application, which is one of the difficulties, in scriptable

object administrations, as host application configuration may vary project to project significantly. I had half of the day with application specialist meeting to resolve those.

Thursday

I had a meeting with a colleague that was on vacation last week. It revealed that there is some planning risk as colleague has under planning against the time needed to do the tests. As next week is team meeting week, we have decided that we will have meeting withing week to check the progression. He already provided me with some testing results via the new project view, and we can track multiple scriptable objects tests in parallel.

Friday

As the manager was on vacation last week, we, I have asked to have a meeting to review topics regarding the scriptable object process as they will be discussed next week at a team meeting. We have reviewed the current status. Basically, the outcome was that we are all in good shape now. I have pointed out that I have sent separate training slots for project managers. Idea that project managers will be trained on scriptable object request process for delivering as objects request process. I needed to synch with the manager as it will impact the overall project delivery structure and that the training structure is consistent with our strategy. Idea is that we will have early review for all projects scriptable objects at startup and project managers will contact scriptable object leader for review and then a deliverables list will be locked and from there on earlier mentioned project view will be used to track to the delivery of scriptable object. I have tuned the presentation slides for next week.

Analysis

This week I have waited for a colleague to return from vacation to proceed with the testing. During his absence there were more than 20 scriptable objects to test. This may become a bottleneck. As a positive side note I got some feedback on a few scriptable objects via a new project overview and our progressions becomes tracked more precisely, even though fragmented over time. As progression gets fragmented it is important to have good tracking process of status where everything is, as relying on fragmented status notes, excel sheets or even memory becomes unreliable and difficult to maintain for hundreds of scriptable objects in parallel. Here, this new project view will play crucial role as it will become not only batch singing tool but also process tracking tool, process management tool, of each scriptable objects including attributes like status, documentation status, validation status, open issues and testing results. If needed, I could even measure what are the biggest waits, but we need to progress one step at a time. In sense this view has become project management tool with light features and tailored for large scriptable object administration for rather big and fragmented installed base.

Project management tool implementation itself has been noted to be correlated with quality and ISO standards like ISO 9000 and 9001 but also an important way of reorganizing business for improving it (Leymann et al 2009, 433). As I target quality and developing new streamlined process this suits my approach. It also should be noted that success of many process executions relies of proper configuration of chosen process management tool (Wimmer 2003, 299). As solution has some become propriety, in abstract it is hybrid of project management tool, version control software and Integrated development environment, it main purpose will be as any other project management tool, not only for documentation but also for tracking of process for measurability for Six Sigma. I could also question whether some existing tools could be used to achieve same functionality, but as this project view evolved from mass signing feature requirement, none of the existing project management tools could provide these as part of default features. Therefore, I conclude that this is suitable solution as doing one feature and getting other as added benefit.

In context of earlier mentioned project, I have some doubts whether we will manage to the next milestone in time for project milestone as I see that currently there is a need for more testers that will find the bugs and provide the results. I need to have an intermediate check next week on tests results. The situation of slow progression with testing had led ne thinking of changing approaches to testing. Testing could be automated, but earlier before, as I have evaluated, it requires some extra development and coding due complexity of scriptable object interaction with host application. At this stage, priority was more on automating the administration platform and allowing me to do the measuring's based on it. Then, maybe, based on these measures, I could estimate, what is more optimal, investing the time to code new features or using existing procedures for testing the scriptable objects. As I have said, scriptable objects could be considered as mass customization solution. As for the mass customization perquisites mentioned earlier, it is crucial first to ensure the ground features that will allow mass customization via modulization (Pries & Quigley 2012, 274) and configurability and supporting tooling.

Other part of the week I considered reviewing the milestone with scriptable object administration in the sense that next week we have a team meeting. I needed to prepare some use scenario presentation. The template I have used could be used as a reference sample for streamlining other scriptable objects. It makes me think that there will be a good discussion on this after the presentation as it supports mass customization via configurability of host application and simplifies scriptable object administration for use scenarios it covers. Besides this template there are also other templates coming as during code refactoring, I have used the same principles.

I mentioned earlier that refactoring will be one important step next to validation, whereas validation is the last step ensuring that all is good before production deployment. As

validation, which in formal, is just a procedure, that aims to ensure that code, documentation and tests documentation fulfills design characters just before deployment, it may posit risks in failing validation and consequent failed validations may lead failing deadlines, therefore design characteristics should be ensured far before validation also as documentation completeness. Rationally they should be ensured during the planning phase by ensuring correct templates, documents, test protocols templates and possible refactoring. And this is one key point of Six Sigma, ensuring that we have design characters that meet customer voice and actual process that aims to create solutions matching with less variation in effective way (Ehrlich 2002,45 ; Jiju ed. 2020,103). Therefore, I have introduced training for project managers, as I need to catch project deliverables already before any work is started on any project. Based on this I can plan or provide consultation for project stakeholders on what templates, documents and test protocols should be used, and main point if any refactoring will be needed. In this sense, as process owner, I will have two entry points when I can affect actual scriptable object usage on project level. From streamlining and effort point of view, the earlier the correct template is used the more time is saved overall.

I have ended the week synching with my manager to ensure that my ideas are in synch with other processes and our strategy overall. Some slides I have created will contain process visual mapping. These will be used in future or driving actual process in visual format after discussion with colleagues in team meetings.

3.6 Week 6 08.04.2024-14.04.2024

Monday

Today I made additional preparations for the team meeting to which I travel tomorrow. From my side there were travel administration things to solve. Half of the day I had some meetings on some scriptable object templates that were needed for upcoming not started projects.

Tuesday

Today I travelled to the meeting place. Some of my colleagues were together on the same transport. I had managed to discuss some scriptable object administration things face to face. I have also agreed to some follow-up meetings on them. I had some discussion with the project manager on some scriptable object's changes needed on production, and we agreed the changes on Monday. In overall day was mostly about meeting colleagues and project stakeholders face to face instead of remote meetings. Discussions were more unofficial but concrete on some examples.

Wednesday

Today I participated in the whole day team event. It was more about the same topics as thesis work discuss about like standardization, streamlining work and minimizing deployment times. I was more listener and day from my side was more on checking that tactic on scriptable object administration is aligned on our strategy and that work is on correct direction.

Thursday

Today I had some presentations on scriptable object administration. I have reviewed the standardized scriptable object that covers 20 scriptable object use scenarios. Explained when to use and when not use and what actual process is behind it. There was expected discussion on upsell opportunities. I have explained how upsell is organized on standardized templates overall and how I aim to monitor via the administration process. I have not mentioned it earlier, but one of the secondary goals of scriptable objects administration is the upsell strategy. An up to date and standardized installed base is prerequisite for upsell strategy.

I have also introduced what the new scriptable object request process is. I have introduced in presentation that request process will have new centralized phase in request which aim to ensure that before doing any new development it is ensured that existing templates are evaluated, whether they cover customer requirements, if they could be adjusted to be covered or some existing template could be refactored to cover. This has streamlined to that each project has to have strict project deliverables identified in the project startup meeting. Then I explained the concept for scriptable object project management tool, that earlier developed project view covers. I have explained with tool we will achieve yesterday discussed standardization on documentation and tracking of progression across all projects.

During breaks there was random discussion on topics that were not easy to raise during remote meetings. Some of them considered scriptable objects and some other project deliverables. I had overall good discussions that would have been remotely omitted. For me these face-to-face discussions explained colleagues' starting points and views more than our usual daily remote meetings. I had also a discussion on fragmented way of work which slows down scriptable objects testing. With some project managers I have managed to discuss documentation of the scriptable objects process and have already managed to advertise next week's coming project manager training.

Friday

This day was summary day. We have reviewed where we are project implementation overall and how we could organize our team and cross-team cooperation remotely. There were many good ideas that concerned personal communication. It summarized mostly to use Lasswell's 5 W Model by first letters of words which means who, what, which channel, to whom and with

what effect (Feicheng 2002, 24). From my side it concerns not only communication with customer incidents but also with all stakeholders and using project management tool for scriptable object administration.

Analysis

As earlier I have mentioned, this week is this project overview point, in context of our overall team strategy. During this week there was a review of overall how we, colleagues, that work mostly remotely, can streamline our work and make our communication more effective. And these topics that were raised were the same as I mentioned in the Challenges chapter. It was mostly summarized to Lasswell's 5W communication (Feicheng 2002, 24).

In context of my work, I have described the current strategy on scriptable object administration. My main point was to summarize, that the most where we can optimize and streamline our work, is to identify for each project what scriptable object to use and choose correct standardized templates centrally via request process as early as possible during each project execution. This means that work evaluation phase in overall will play a crucial role in entire process efficiency, and earlier mentioned validation sub process will be just last gate keeper to ensure that we have followed the actual process correctly. In overall, as planning phase becomes crucial. Next to it, I mentioned earlier, process management tool that is correlated with quality and success of process itself, becomes also crucial in organizing the actual workflow. It will automate many steps that were before manual, with email discussions or separate excels files. It will streamline the workflow and status tracking by itself. During the week there was an overall discussion about how to use standardized documentation templates, and I, as I see it with scriptable objects administration, the project management tool itself will work as a documentation management tool and streamline to identify that we use standardized procedures for documentation. The validation process will ensure itself that documentation is accordingly done and is kept up to date. It is important that documentation is kept up to date and there are proper maintenance activities on it (Persse 2012, 283).

As I look now retrospectively in the beginning of thesis, refactoring and validation were the main concentration areas of scriptable object administration. But, now as most common, scriptable objects get more standard templates, bottlenecks have now skewed to availability of testers, subject matter experts or other stakeholders. Because the delivery teamwork is highly segmented in time, communication becomes crucial, and that was one of the topics discussed with colleagues also in team meetings. On one hand whether there should be dedicated administration and testing resource as full time for administration could be revaluated as earlier, I mentioned that mass customization layer of scriptable objects could be moved to configurability level but that requires more investments to refactoring phase. It

always should be checked by ROI, return on investments. ROI is financial benefit or loss out of investments that were made into project (Khosrowpour 2006, 167). Whether it is rational at this stage lifecycle of host application, requires proper resource measurability at deliverables level, which only now starts possible with new tooling. But here, with current organization of work, I see that organizing it with a large installed base could be streamlined only with a proper project management tool that holds inside earlier mentioned status, history, documentation, and code signing features at scriptable object level.

In sense of the DMADV methodology, as prerequisite is to get overall measurability of the process, I have made each scriptable object identifiable with OID, and categorized by use scenario type into groups, which in overall will get, with this tooling, process statistically measurable at each deliverable level in future. That will be the foundation for future optimization of the process and efficiency tracking. Meanwhile, to emphasize the need for early recognition of deliverables during project delivery, next week there is planned project manager training by me for the scriptable object deliverables. I have also identified based on earlier notes that my planning is sometimes in conflict with project plannings done by project managers. For example, I need any subject matter specialist for testing or feedback that entails needed skills, but I am provided by project managers a named subject matters expert even if availability is not synched with actual delivery while work could have been any available subject matter expert. Therefore, there will be some discussions next week on resource planning and coordination, as coordination is essential in preventing conflicts in projects execution (Spiess & Felding 2008, 5).

3.7 Week 7 15.04.2024-21.04.2024

Monday

During the day I mostly reviewed the emails and activities that were delayed last week. There were tens of emails to answer. In context of scriptable object administration there were a few requests that needed to be handled.

Tuesday

Today I received a request on a scriptable object to which I tried to propose an existing template. I had multiple email exchanges to clarify whether a few changes could fulfill the needs. Based on the email it was still unclear whether the implementation will be done. Then I had a meeting that considered a set of scriptable objects that work together to fulfill specific use scenario. It was already working but we needed to review the existing solution and find a new less maintenance time requiring solution. It took 2.5 hours to just review the current implementation and make some plans for further changes. I have also prepared for

tomorrow's project manager training where we will go through the administration process from the project manager's point of view.

Wednesday

Today I had kept the training to the project managers. I have used the same slides from last week and some small adjustments. Training clarified many things and there was real discussion on the process. For myself I had cached that visibility and training should be increased for project managers. Previously I identified that the same thing is also for other stakeholders. There was also discussed RACI matric as who is accountable and who is responsible.

Thursday

I had proceeded analyzing the tests for project 2 week ago mentioned. Application specialist was using project management view for scriptable objects, and we cached all our communication and status changes via it and clarified things via Teams chat. During tests I identified that old testing context could be lost via current test document which includes more detailed test finding that project management view. I proposed a new template which has better detail and has the possibility to keep test iterations in more detail. Asked application specialist to comment it. Eventually we ended up coming to conclusion that the new template is better. For the new test I decided that we will use this new template.

Friday

There was one project go live for which I consulted how to proceed to documentation. Provided the steps and who will do those steps. Here as an example in future I would not be needed so much involved as previously with this refactoring. I had a meeting with an application specialist where I went through the same slides as with project managers. Here the concertation was more on details like how to use project management view, how to document, where we are with standardization. Which templates are standardized. There was some good discussion on how different templates are used cross projects. We went through some templates on how they should be configured and how it could affect the upsell strategy. Here idea from my side was to increase harmonized approach across the teams. In overall this followed last week strategy and training keep on Wednesday for project managers.

Analysis

This week I identified the main topic as training the stakeholders for the new steps in the process. For project managers the main topic was to increase the early recognition of what we need to deliver as part of the projects and make related tasks according to scriptable object request process. As proper process documentation is prerequisites for training

personnel during execution (Yang 2005, 307), I have made process documentation beforehand, with visual maps and associated work instructions documents. These were then used as a source for training materials. Steps itself were widely accepted. There were some visibility and responsibility questions that need clarification in future. Especially who provides what input at different process execution phases. It could be described with the earlier mentioned RACI matrix, where clear roles and clear tasks to do for responsible person are described. It just needs to be clarified with more details in future as some already exist. In the same context separate training was provided for application specialists, who are in most cases subject matters experts. While for project managers it was high level responsibility, for applications specialists more detailed information was provided, for keeping each layer not burdened with too much detail. With application specialists I have reviewed what is expected from them, mostly, in context of documentation and tracking the process from a project management point of view.

Important things were incorporating new testing templates for better tracking history different iteration tests and also collecting feedback on documentation itself, that is generated for each scriptable object. With asking people that will use the documentation, it will retrieve what is the most valuable in documentation for the customers, which applications specialists also are, rather having big unused, big, massive of documentation, besides the regulatory requirements (Tayntor 2014, 176). One aspect of the process is keeping low maintenance costs and the ease of updating existing documentation in future. In project management view I had some developed features that had automated dependency checks on documentation, to ease finding affected documents in case of change needed. A significant part of streamlining the documentation process was done with new features coded as part of the project management view, also significant part of time of overall administration process as for now. But in context of ROI, its paybacks already now with better tracking of the process and more consistent documentation.

I had previously mentioned development and test work could be fragmented in time and for those purposes, catching in documentation the historical context is important, on top of the status management. I demonstrated a new template to an application specialist, and it was accepted well, though there will be a need for separate training sessions. Besides this, there is also new project management view training still to be planned. For that I need to find a good slot within few weeks. Now as the process itself gets in more stable shape, training will be the next main point to concentration. Other activities of the process will be left for continuous analysis and continuous improvement, like refactoring, standardization, and better documentation. Proper documentation of the process is prerequisite for its analysis (Yang 2005, 307). Keeping consistent documentation instructions and consistent documentation practices during all steps will ensure auditing possibilities of these steps (Nanda &Robinson 2011, 266). In overall, project management view, training, consistent

standardized templates are targeting to minimize deviation in scriptable object deployment, making it measurable and auditable afterwards.

As the standardization process goes on, and will be permanent part of the process, we have reviewed that it required some commitments from different projects in future, that old scriptable object may require changes in future. In summary, as part of the process, stakes holders have been trained, that two points, request and planning and validation, are the most important ones. Now it is ensuring that process gets visibility and stakeholders continuously trained following weeks.

3.8 Week 8 22.04.2024-28.04.2024

Monday

Today I had a meeting on projects that concerned partly scriptable objects. It was mainly a review of what the deadlines are and abstract discussions. There was one specification meeting. One incident escalation review where proper documentation changed it product enhancement request. Overall day was reviewing and making plans for what needs to be done for projects during this and other week.

Tuesday

Today I provided mainly guidance to colleagues on documentation and testing steps for a few projects that are in finalizing state. Provided with direct links to the project management view for these specific projects. As one clarification each project has a static web page, which can be accessed by all stakeholders to see the current status of scriptable objects for this project. Colleagues just needed to type in missing details and change the status when all is ready for reviewing and code signing. Here my role was more administrator and ensuring that steps are clearly documented and by involved counterparts, which should be in future most of the projects. Here it also raised me to review the measuring and capability of the process also as how it streamlined the steps compared to starting point.

Wednesday

Today I worked with an application specialist to review some tests results from last week. We have used project view and new test documentation template. It was clearer what and where we left and what was not working. I updated some library code and reused many scriptable objects and informed another colleague that he uses those. Here work has been little bit in in parallel on same use scenarios.

Thursday

I have used part of day to adjust one scriptable object to work little bit different based on application specialist comments that I got yesterday. Here I used the same coding practices as before. There was one incident request on scriptable objects. It revealed that there was some deviation in API usage that caused the incident. It raised some topics to discuss on deployment checklists to review.

Friday

I had some upselling discussions on some scriptable objects. Had reviewed some requests that were on scriptable objects. There was an unclear request and tried to provide existing solution, but due unavailability questions subject matter experts questions left unanswered. There will be a meeting next week.

Analysis

During the week I have had a new request for scriptable objects where I tried to propose existing templates, but it raised additional questions. As previous weeks I have mentioned, the strategy is to emphasize the use of similar standardized solutions. It may require more specification time and meetings between subject matter experts which increases time usage during specification phase but will pay back in the long term. Mistakes at the requirement collection phase and design phase can eventually lead to higher multiplied costs (Saleh 2009, 268). Role as scriptable object administrator is that installed base does not get fragmented for existing use scenarios but there is reuse of the code across different scriptable objects, keeping the code smaller. It can be achieved by making perfective maintenance and preventive maintenance. Perfective maintenance improves functional and non-functional performance of the scriptable objects whereas preventive making it more maintainable, where all these could be included in software evolution plan for long term software economics (Saleh 2009, 268).

Bigger and more complex code, especially in the number of lines, will add more administration and documentation needs in the long term. It will also increase troubleshooting times compared to when standardized templates are used. In context of maintenance having simplified and standardized code will be crucial as it will also allow to delegate basic troubleshooting to less experienced technicians, or service desks, as during this week, I had encountered with few incidents troubleshooting, where it, all condition matched could have been delegated to service desk. On long term goal is to make these objects easier to maintain.

In context streamlining of the process with big fragmented scriptable object install base I have looked topic, in context of the product, in my case scriptable objects itself, and process context, where I have added steps that ensure consistency scriptable objects across different projects also as consistency of the documentation associated. Here the project view plays a crucial role. As with hundreds of scriptable objects there is need to arrange control of hundreds specification documents and hundreds of test documents. Project view itself handles here also role of electronic document handling tool to automate and streamline whole process. Having electronic document handling tools plays a crucial role in reducing cost of quality. It allows easier to provide metadata for auditing purposes (Skipper 2015, Chapter 3). This week we have shared links to different projects' views, where responsible colleagues just typed the needed details. It will be the same across all projects and there will be no possibility of skipping this step. This makes process deviations minimal.

This week could be also considered as the process starts to be really used with all its supporting tools across projects. As for earlier mentioned KPIs and could see the actual evolution of process in context of these. This made me think evaluate in future process capability in real measurements in context of Six Sigma process capability index. Capability index is numerical summary of process or product performance against specifications (Harry 2004, Chapter 9.1) For example, as target of the product, in sense of incident amounts across projects, specification time, development time or what are the wait times. As of the goals of this thesis, it is to create a streamlined process and get it measurable in context of chosen methodology at different phases. In the future it could be measured context of deviations. Nevertheless, I have made basic review evolutions of KPIs, and we are in plan in terms of documentation tracking at this early phase of this process.

In overall concentration is skewed more to planning phase also as how to make administration and support much easier in future. This week has shown that there are still some things to be done with the existing installation base to make it simpler to do the support activities. I had some incidents where logging could be improved and documentation to be simpler to read as these topics affected that incidents took more time to solve. These in context preventive administration and adding improved logging best practices and following standard documentation templates as of earlier mentioned ITIL practices or ISO 9000 standards.

Now process is getting incorporated in normal daily work with all supporting tooling. With real time feedback that I get it really gets things more simplified. There are still some training sessions to come and all aspects of the process, but the main components were already autonomously used by colleagues. One thing not to forget is to keep up to date work instructions for different parts of the process. Groundwork with tooling was solved with this project management view, batch signing and unique identification of all scriptable objects with OID.

4   Conclusions

The goal of the thesis was to create a process that streamlines the administration of large scriptable objects across a big installed base. Here The scriptable objects are complex entities that are done with one of the programming languages and aim to extend the features and behavior of the host application they are running on. The complexity of the tasks was in that scriptable objects may have been created by different independent teams or colleagues producing different code for the same use scenarios. Besides this, different projects may have host applications configured differently producing unintentionally code changes to original script. All together this has produced fragmented code base within the installed base. Based on internal findings it led to longer deployment times and longer troubleshooting times. Additionally, there were also regulatory requirements on documentation that should be kept up to date. This all together put constrain what the process should cover.

During the thesis I have used some concepts of DMADV methodology to create new processes and make it potentially measurable in future. First work concentrated on scriptable objects itself. I have made Voice of customer analysis to identify requirements for the scriptable objects. I made inventorying of code base to see potential deviations against them. As result I have ended refactoring commonly used code blocks and making them available as a separate shared library. This allowed u to create more reusable and more parameterizable code. This made possible customization of host application via scriptable objects but in more controlled way via parameterization, rather complete recoding. It of mass customization via parameterization of the scriptable objects. As result I have identified that each scriptable object should go standardization review on possible refactoring on new projects and made parametrizable much as possible. It took in the beginning rather much time but already on second projects deployment times were already significantly smaller than in the past.

As quality requirements each scriptable object should have an associated specifications document and testing protocol document. Process should ensure that each object have them. As the installed base has a large number of scriptable objects, I had identified that there is a need for separate tool I had created for each object own unique identified across all projects. This has made scriptable objects look more like an asset and the whole process as asset management process. To ensure that these assets are not changed out of the process in future and have create code signing feature for them. It ensures that documents and code are signed together with the certificate. All together the whole history of each scriptable object could be tracked precisely, therefore. It was successfully tested and validated. It helped to see which objects have been signed and those that were signed, whether there are changes that are violating the sign hash.

There has been created separate views that remind document management or project management tools. With these views as process owner, I could see scriptable objects per project, status, documentation status and assign responsible persons to fill missing attributes. In overall making each scriptable objects to be an asset, allowed these to happen. This and project management tool abilities allowed significantly to automate the whole process and made it more standard across different projects. Besides, I have added some helpful features that reminded source control management system, document management system and project management system. These simplified some routine actions like comparing scripts between each other across different projects. As literature notes, project management software may increase quality, with scriptable objects it helped already to minimize deviations in this case.

As one of the steps ensuring that all steps were followed before deployment is validation, it is the last phase to ensure that all has been accordingly. But it was identified that to be more efficient, planning should happen centrally already in early design and planning phase. This was successfully brought to the attention of all counterparts. Separate trainings have been provided to projects managers and subject matters specialists that may have been initiators of scriptable object deployment. There were multiple training sessions.

One of the requirements was also to align the process with other processed and working principles of the organization. This process depends on the actual project delivery process. I have identified that there is a need for more training in resource planning in the context of this process. The weakest point has been identified as fragmented work across multiple projects, but project management abilities helped to keep track of each scriptable object development. Process with this project management tool capabilities have become measurable, with amount of code, number of signed scripts, scripts having associated documents, number of incidents.

As part of Six Sigma process has become potentially measurable and in future as part of Six Sigma continuously improved by. In overall the goal of this been achieved. The process incorporates the steps to simplify current installed base code and introduced working instructions to produce simpler and standardized scriptable objects and tooling that allows administrate the whole process automatically in simple and visible way to all counterparts.

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Figures

Tables