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THE MODELS OF VALUE-DRIVEN PROJECT OUTPUT CONFIGURATION MANAGEMENT PROCESSES

Abstract. *Creation value in projects is the major factor of ensuring enterprise competitiveness. The most important driver for ensuring effective value management in projects is the development of the principles and models of value management processes. The main aim of this article is to increase the effectiveness of project management through systematization and development the models of value-driven project output configuration processes. The system model for project output configuration management processes representing the combination of external and internal description is presented. The functional processes models for value-driven project output configuration, building project output configuration and planning value delivery are developed and shown. The model includes such value-driven tasks as defining minimum viable product, forming minimum marketable features set and developing value delivery plan. The features, inputs, outputs, mechanisms and controls of selected processes are shown. On the basis of developed process models the model and scheme of integration of project output configuration management with other project management processes on the example of scope management is proposed. The information relationships with scope management and their content are defined. Application of the developed model allows: to integrate and to align project management processes, devoted to obtain project output and to satisfy stakeholders through providing them an expected value and to increase the transparency of project team actions within project phases and stages through monitoring and control the states of project output. The models proposed are the basis for the formation of a holistic concept of value-driven project output configuration management.*

Keywords: project management; value; value-driven project management; value management model

Introduction

In the global competitive environment continuous growth of companies, state-owned enterprises or business corporations depend on the value generated by these organizations year after year, the severity and permanence of their intentions to be innovative.

As it shown in [1] "the in-depth value-based analysis of project management methodology in order to develop the content and terminological apparatus clear for practitioners is needed" [1, P. 105]. However, the methodology, models and methods of value-based innovation project and programs management are just beginning to develop and grow [2].

In this case, there is no doubt in feasibility and urgent need to develop such a theoretical basis for the project management methodology updating and improvement.

Research problem statement

According to PMBoK, through the effective use of portfolio, program, and project management, organizations will possess the ability to employ reliable, established processes to meet strategic objectives and obtain greater business value from their project investments [3, C. 15].

The most important driver for building effective value management in projects is the development of the principles and models of value management processes.

The aim of the article

The main aim of this article is to increase the effectiveness of project management through systematization and development of the models of value-driven project output configuration processes.

Recent research and publications analysis

P2M – is one of the project management methodologies that pay considerable attention to the value management questions. A key feature of P2M in the context of value management is the strategic planning and management of the program on the basis of criteria aimed at achieving the program planned value. It is noteworthy project definition in P2M: "A project refers to a value creation undertaking based on a specific, which is completed in a given or agreed timeframe and under constraints, including resources and external circumstance" [4, P. 15].

According to P2M program value management implies the following:
− program mission profiling is carried out through the expansion of the program potential value;
− program architecture development is based on the main goal – full achievement of program planned value;
− management is carried out on the basis of the criteria of program planned value achievement.

In the P2M the general methodology for program value evaluation, intended to help managers achieve the planned level of value is presented. Also a general logic of designing the basic value structure on the basis of unique balanced scorecard of 5E and 2A [4].

In [5] is shown that, value management is a series of processes, aimed at development and maintenance a project value measuring system. The roadmap that show the way of value creating through program implementation and general recommendations for program management, value evaluation and value indicator selection is presented.

According to Agile methodology project management is closely related to the value concept. One of the main project management aims is to deliver value as early as possible. This is postulated in one of the Agile Principles [6]. However value management in Agile is not formal and is rather a recommendation.

In [7] the next key actions directed to value evaluation are proposed: stakeholders identification, value definition, search for solutions that form short delivery cycles etc. The value quantification method based on the use of Impact Estimation Tables is presented. However recommendations are too general and quantification based on transformation value into process specifications adds subjective perception of business analyst or project manager.

In paper [8] the concept of value profile as a triangle of intellectual capital value (knowledge and innovations), value of ownership and value of assets is proposed. Besides, so called value harmonization indexes space model presented by company's clients, personnel and management is described.

As Ries says in his revolutionary work about startup lean management, "lean startup method is not about cost, it is about speed" [9]. An integrated approach to startup management based on the use of the cycle "Build-Measure-Learn" is proposed. Rice suggested the concept of *minimum viable product* (*MVP*) – that product which has just those features and no more that allows you to ship it to early adopters [9]. Therefore selection and fixing value for stakeholders and definition of MVP is an important aspect of output configuration building. The concept of MVP is similar to the idea of *minimum marketable feature* (*MMF*) that is considered in detail in the work [10].

The main part

The implementation of value-based project output configuration management assumes that it will be considered as a process, which should be designed specially and carefully. In this case project manager must understand a value problem, value structure, features of relations with concurrent value management systems.

From the viewpoint of general systems theory [11] the process model of value-based project output configuration management can be considered from two viewpoints. On the one hand (external description) it is an integrated object S_1, that performs function of management. In this case we assume that the function of management is the reflection of stakeholders demands X to the set of project deliverables (project output features) Y, directed towards forming project output configuration that meets stakeholders expectations and fixes appropriate value that is described by the following relation

$$S_1 \subset X \times Y$$

Here the set X is formed by system inputs (under the system we understood integrated collection of hardware, software, human and other resources, that implements management function), and the set Y – by system outputs as the results of its operation purposes. In particular, *information from stakeholders*, *project plans* and *project updates* form system inputs, as well as *project output configuration* and *project documents updates* represent its outputs.

Combining system inputs and outputs to one set V_i, named system object [11] we will get:

$$X = \times \{V_i : i \in I_x\}, Y = \times \{V_i : i \in I_y\},$$

where the sets I_x and I_y form partition of the set I, ie.

$$I_x \cap I_y = \varnothing \wedge I_x \cup I_y = I.$$

Than the expression describing the system takes next form:

$$S_1 \subset V_1 \times V_2 \times \ldots \times V_m.$$

On the other hand the system of project output configuration management represents a set of management procedures – well defined combinations of actions as a result of which a non empty set of managerial decisions concerning project output composition, a list of required value, value delivery process etc is made.

The set S_2 that represents the internal system description is characterized by structure determined by the features of project output configuration and value management processes which will be shown below:

$$S_2 \subset C_1 \times C_2 \times \ldots \times C_n$$

where n – the number of managerial procedures.

The examples of managerial procedures are *stakeholders' value systematization*, *development project output configuration*, *MVP structure definition*, *value delivery plan development* etc.

Thus, the holistic description of the system for value-driven project output development takes the next form:

$$S = \begin{cases} S_1 \subset V_1 \times V_2 \times \ldots \times V_m \\ S_2 \subset C_1 \times C_2 \times \ldots \times C_n \end{cases}.$$

To get the system internal description we must make functional decomposition that captures the logical relationship between the system structure and functions,

i.e. connects the internal and external descriptions. We will make decomposition taking in account the features of value identification, creation and delivery in project.

The general functional model value-driven management of project output configuration is shown on Fig. 1. This model holistically describes project output configuration management process from the viewpoint of project manager. The model defines configuration management process throughout value life cycle – from its identification through configuration development and delivery planning to delivery management. The key feature of the model is continuous analysis and work with value through its involvement in project management process.

This is achieved by the very formulation of the concept of value-driven project output configuration that assumes the union of value for stakeholders and output content. Let us notice next features of the process:

– a set of internal documents relating to value management is formed throughout the process of project output configuration management (*Value Matrix, Project Output Configuration, Configuration Analysis Results, Value Delivery Plan*);

– an input feedback between the functions *Building project output configuration* and *Control project output configuration* is presented;

– the main dataflows connecting the process with other project management processes are the following – *Project Plans, Project Updates* as input arrows and *Project Output Configuration* and *Project Documents Updates* as output arrows;

– a significant part of project output configuration management process must be controlled by *value management methodology* that is being formed and developed rapidly;

– the presence of *business-analyst* and *project manager* in all stages of value-driven project output configuration management is required.

From the practical viewpoint the functions "Building Project Output Configuration" (A 2) and "Planning Value Delivery" (A 4) are the most interesting for us. The content of project output configuration management process is on the Fig. 2.

There are three base functions distinguished in the process structure: *Developing Product Breakdown Structure, Developing Project Output Configuration* and *Analysis and Providing Value Coverage*.

Developing Product Breakdown Structure (A 21) is carried out by *project manager* and is aimed at creating *Product Breakdown Structure* on the basis of *Value Matrix* and *Project Plans*. The *Product Breakdown Structure* obtained is the foundation for *Developing Project Output Configuration* and is stored in the project database for further analysis and use.
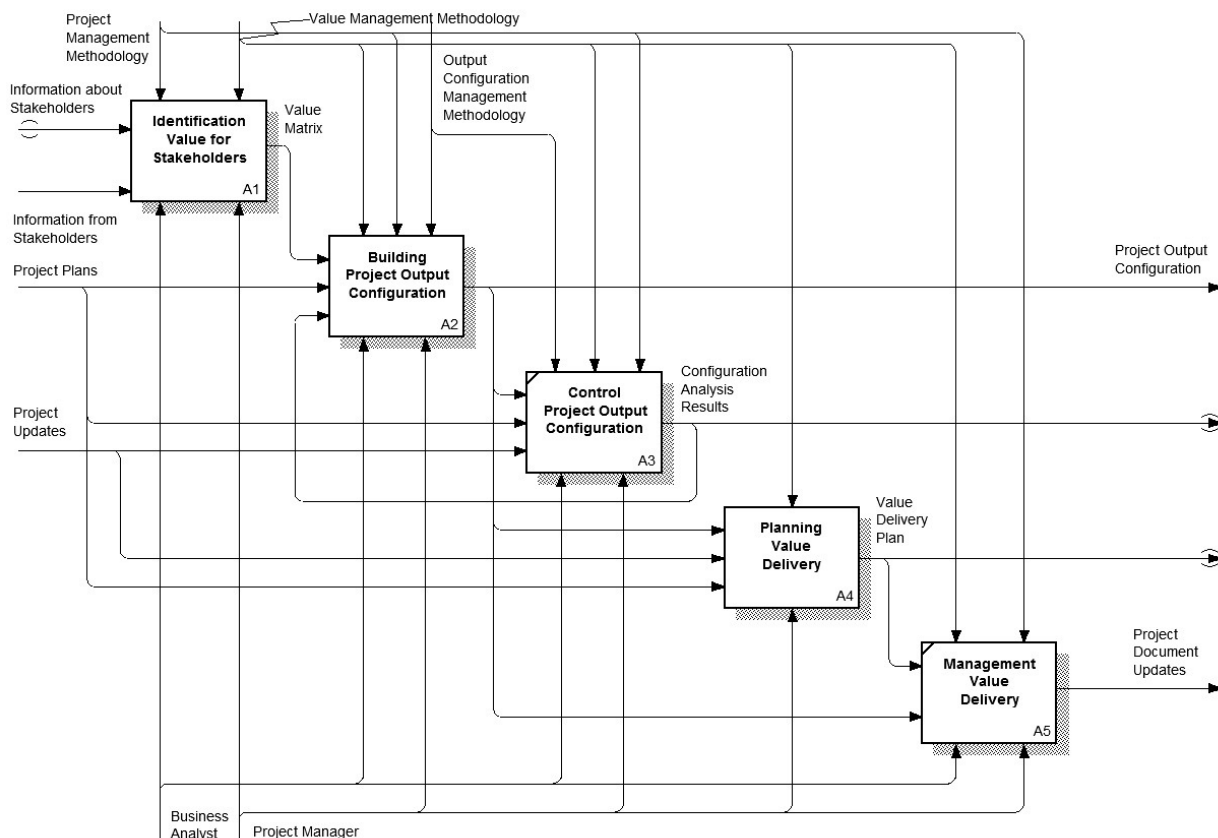

Figure 1 – The functional model of value-driven of project output configuration management
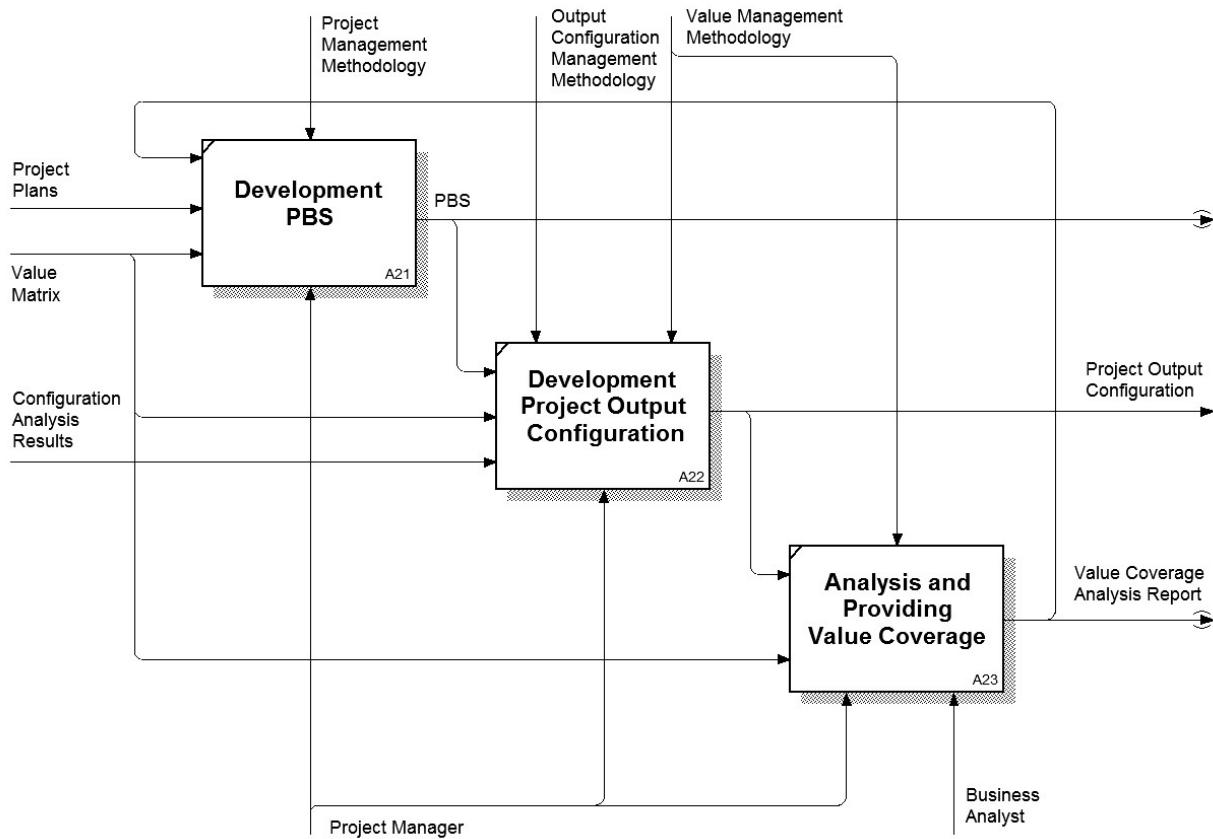
Figure 2 – The functional model of value-driven building project output configuration

Developing Project Output Configuration (A 22) is executed by *Project Manager* on the basis of *Product Breakdown Structure* and *Value Matrix*. There is *Configuration Analysis Results* that implement input feedback with *Control Project Output Configuration*. *Project Output Configuration* is a result of this function that is used in further project management processes.

Analysis and Providing Value Coverage (A 23) is devoted to evaluating the results of Building Project Output Configuration on the basis of comparing configuration content with *Value Matrix*. A *Value Coverage Analysis Report* is stored in enterprise knowledgebase and is used for establishing input feedback with the function *Developing Product Breakdown Structure* – on the basis of its content the corrections in *Product Breakdown Structure* are made. A *business analyst* is taking part in analysis besides project manager. A Product Owner usually plays this role in Agile projects [12].

There are three base functions in Planning Value Delivery: Definition of *Most Valuable Product* (*MVP*), *Forming Minimum Marketable Features Set* (*MMF*) and Developing Value Delivery Plan (Fig. 3).

Definition of MVP Structure (A 41) is devoted to selecting key value in *Project Output Configuration* and

definition of *MVP Structure* – part of project output that must be implemented first of all. The function is implemented by *Project Manager* guided by *Value Management Methodology*. *MVP Structure* is stored in project database and is used for future work.

Forming Minimum Marketable Features Set (A 42) is conducted by *project manager*, guided by *Value Management Methodology* and on the basis of *Project Output Configuration* and *MVP Structure* he defines a *MMF Set*. An *MMF Set* obtained is used for *Development Value Delivery Plan* and is stored in project database for further analysis and use. A MMF Set is the foundation for forming Product Backlog [12].

Value-based project output configuration management is closely linked with all groups of project management processes [3]. Let us consider the integration of developed process models with other processes on the example of relationships between value-based output configuration management and the project scope management. Table 1 is the relationships between value-driven project output configuration management and project scope management processes: plan scope management, collect requirements, define scope, create WBS, validate scope, control scope. These relationships are illustrated in Fig. 4.
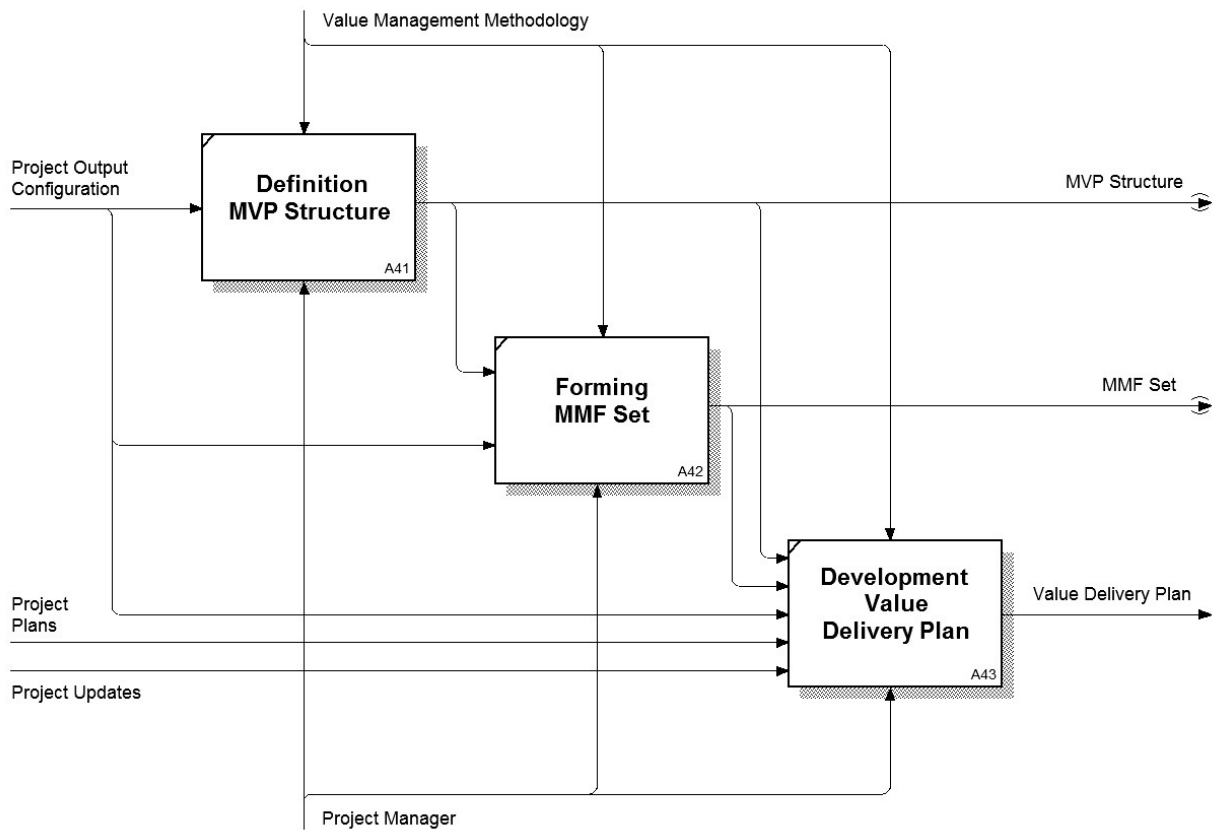
Figure 3 – The functional model of planning value delivery

*Table 1 – **Relationships between value-driven output configuration management and scope management processes***

Process Name	Relationship Content
Plan Scope Management	• Scope management plan; Requirements management plan
Collect Requirements	• Requirements documentation; Requirements traceability matrix; Project output configuration; Value matrix
Define Scope	• Project scope statement; Project documents updates (Stakeholder register, Requirements documentation etc.); Project output configuration; Value matrix
Create WBS	• Scope baseline Project documents updates (Stakeholder register, Requirements documentation etc.); Project output configuration; Value matrix; Value delivery plan
Validate Scope	• Change requests; Project documents updates; Project output configuration; Value matrix
Control Scope	• Work performance information; Change requests; Project management plan updates; Project documents updates; Organizational process assets updates; Project output configuration; Value delivery plan

Conclusions

Application of the developed model allows:

– to integrate and to align processes directed to obtain project output and to satisfy stakeholders through providing them an expected value;

– to increase the transparency of project team actions within project phases and stages through monitoring and to control the states of project output;

– to identify ways to ensure the stakeholders involvement and engagement in the processes of product formation and value creation.

The developed process models are the basis for the formation of a holistic concept of value-driven project output configuration management. Further research should be directed to the formalization of processes and models of value management in projects.
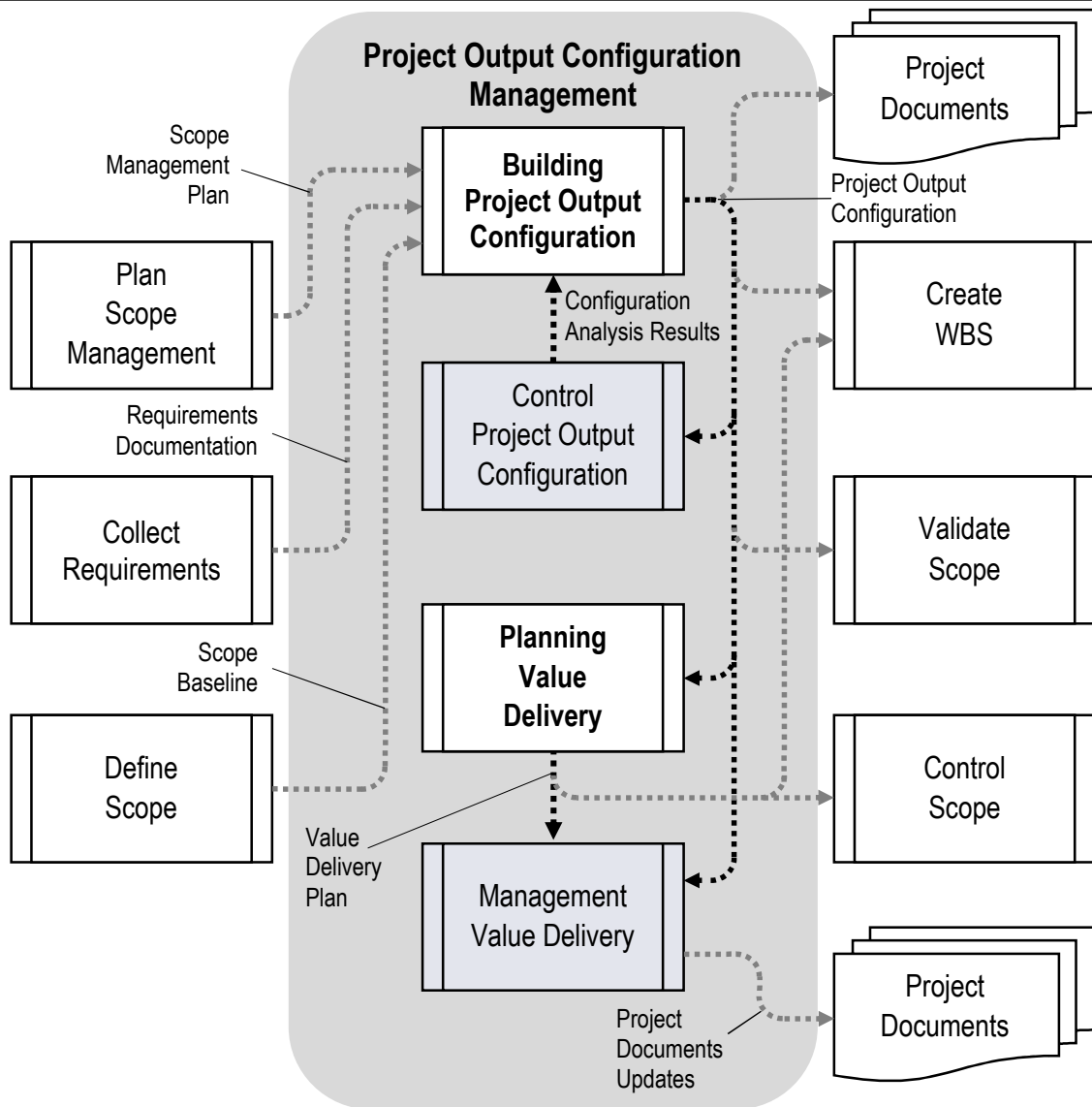
Figure 4 – Communication between value-driven project output configuration and project scope management

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МОДЕЛІ ПРОЦЕСІВ ЦІННІСНО-ОРІЄНТОВАНОГО УПРАВЛІННЯ КОНФІГУРАЦІЄЮ ПРОДУКТУ ПРОЕКТУ

***Анотація.** Розглянуто проблему ціннісно-орієнтованого управління проектами. Запропоновано загальносистемну модель процесів ціннісно-орієнтованого управління конфігурацією продукту проекту та функціональні моделі процесів управління конфігурацією, побудови конфігурації та планування передачі цінності користувачу. Розроблено модель та схему інтеграції процесів управління конфігурацією продукту з базовими процесами управління проектами на прикладі управління змістом.*

__Ключові слова:__ управління проектами; цінність; ціннісно-орієнтоване управління проектами; модель управління цінністю

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МОДЕЛИ ПРОЦЕССОВ ЦЕННОСТНО-ОРИЕНТИРОВАННОГО УПРАВЛЕНИЯ КОНФИГУРАЦИЕЙ ПРОДУКТА ПРОЕКТА

***Аннотация.** Рассмотрена проблема ценностно-ориентированного управления проектами. Предложены общесистемная модель процессов ценностно-ориентированного управления конфигурацией продукта проекта и функциональные модели процессов управления конфигурацией, построения конфигурации и планирования передачи ценности потребителям. Разработаны модель и схема интеграции процессов управления конфигурацией продукта с базовыми процессами управления проектами на примере управления содержанием.*

__Ключевые слова:__ управление проектами; ценность; ценностно-ориентированное управление проектами; модель управления ценностью

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