

# Analysis of Product Design Development Process

(Study Case Designer Dispatch Service Program from Ministry Of Trade Republic of Indonesia)

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**Abstract** Since 2010 Indonesia government has made strategic plans related to the development of creative industries in Indonesia through several ministries, specialized agencies, and official in the province. The strategic plan generates programs and one of them is the Designer Dispatch Services (DDS) program from the Directorate of Export Product Development of the Directorate General of the Ministry of Trade of the Republic of Indonesia. DDS is a program with a fund of 2.5 billion per year to develop products through collaboration between designers and business owners (IKM) aims to produce creative and innovative export products.

Product development is generally intended to represent market opportunities into a finished product, the process of product development can sequence through generic development process. Product development process also involves interdisciplinary study, namely; marketing, design, manufacturing, finance and legal working together in a team.

This research was conducted in order to analyze the method used in the DDS program, to know the process of design and product development and then analyzed through comparison with product development literature.

**Keywords** Government Programs, creative economy, product design and development method

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## Introduction

Indonesian government policy in creative industry development is done through several programs from ministerial to service level, one of them is Designer Dispatch Service (DDS) conducted by Ministry of Trade. With a fund of around 2.5 billion per year, the program aims to develop small-mid scale industry (IKM) product design in order to produce more creative and innovative export products through collaboration between industry and designers. Through field observations it is known that this program is done through several stages ranging from selection, design, evaluation monitoring, making of prototype and exhibition. Specification of output products is determined by the designer and curated by a team of experts from academics and design practitioners. Because the design have certain limitations this research will analyze what are the indicators of success product, how to specify and how to apply.

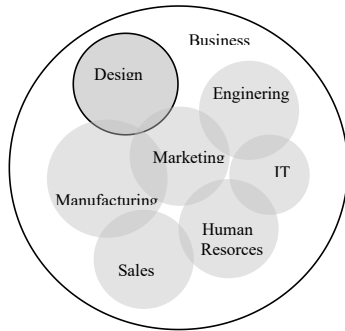
Design is a process of change, its activity is not only done to meet new circumstances but also to change the state through the creation process that occurred (Mayall, 1979). The development of a product design is a design activity to produce innovation and is done on the basis of change, limited by certain specifications which then become an indicator of success. Successful development of a product is determined by parameters determined through several stages of the development process, through interdisciplinary

studies of marketing, product design and industrial management (Ulrich and Eppinger, 1995).

This research will conduct the process of searching data through literature review and participant observation in the field, followed by comparison analysis to compare the literature method and case in the field in determining the product development process. The objective is to obtaining data about DDS product development method.

## Product Design & Development

One of the design principles is Principle of Change (Mayall, 1979), that design is a process of change, its activity is not only done in order to meet new circumstances but also to change the situation through the natural process of product creation. Design becomes a tool in the business discipline, according to Laituri (2006) design in any form is born in the business environment, to meet the interests and business goals (Chart 2.1)



**Chart 1.** Laituri, Design Is a Fundamental Business Function

Design in product development acts as a process of gathering something new or composing existing things in new ways to satisfy the needs that are already known to society (Dieter & Schmidt, 2009). According to Ulrich & Eppinger (1995) product development is a series of activities that start from the perception of a market opportunity that ends by the activities of production, sales and product delivery.

**Ulrich & Epinger Generic Process of Product Development**

Product development process is determined by the objectives themselves formulated in a development sequence carried out through member of team with interdisciplinary studies. The process sequence according to Ulrich & Epinger (1995) are concept development, system-level design, detail design, testing & refinement and production ramp-up. The process then become a step for developing product.

**Concept Development**

This phase identify needs of target market, generate & evaluate product concept alternative and selecting single concept.

**Table 1.** Concept Development Process

PROCESS	TEAM
Define Market segments. Identify lead users. Identify competitive products.	Marketing
Infestigate feasibility of product concepts.. Develop industrial design concepts. Build and test experimental prototypes.	Design
Estimate manufacturing cost.. Assess production feasibility.	Manufacturing
Facilitate economic analysis.	Finance
Investigate patetnt issues	Legal

**System-Level Design**

In system-level design a concept become an assembly scheme, define a subsystems and component of product.

**Table 2.** System-Level Design

PROCESS	TEAM
Develop plan for product options and extended product family.	Marketing
Generate alternative product architecture. Define major sub-systems and interfaces.. Refine industrial design.	Design
Identify suppliers for key components. Perform make-buy analysis. Define final assembly scheme.	Manufacturing
Facilitate make-buy analysis.	Finance
Identify service issues.	Service

**Detail Design**

This phase creates complete specification of the geometry and materials to identify all standard and special parts in a product. The output from this phase is control documentation, process plan for fabrication and assembly of the product.

**Table 3.** Detail Design

PROCESS	TEAM
Develop marketing plans.	Marketing
Define part geometry. Choose materials. Asign tolerances. Complete industrial design control documentation.	Design
Define pieces-part production processes. Design tooling. Define quality assurances process. Begin procurement of long-lead tooling.	Manufacturing

**Testing and Refinement**

This phase evaluate and refinement detail design through prototype process resulting a feedback to answer question about product performances and reliability.

**Table 4.** Testing and Refinement.

PROCESS	TEAM
Develop promotion and launch materials. Facilitate field testing.	Marketing
Do reliability testing, life testing and performance testing. Obtain regulatory approvals. Implement design changes.	Design
Facilitate supplier ramp-up. Refine fabrication and assembly process. Train work force. Refine quality assurance process.	Manufacturing
Develop sales plan.	Sales

**Production Ramp-Up**

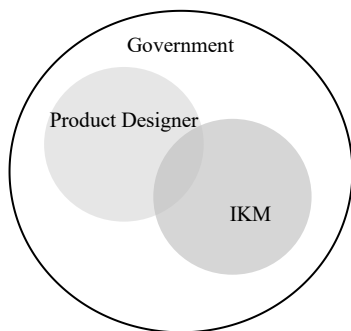
The purpose of this stage is to find the production problem in a predetermined production system.

**Table 5.** Production Ramp-Up.

PROCESS	TEAM
Place early production with key customer	Marketing
Evaluate early production output	Design
Begin operation of entire production system.	Manufacturing

**DDS Product Design & Development.**

DDS is a program conducted by Ministry of Trade Republic of Indonesia. The program aims to develop IKM product design in order to produce more creative and innovative export products through collaboration between IKM and designers.



**Chart 2.** Designer Dispatch Services Diagram

This program conduct a development process in several phase, those phases are design identification, design concept, detailed design, final design, and exhibition preparation.

**Design Identification**

This phase is identifying profile, target market, competitor and production potency of assigned IKM. Output from this phase become a guide for choosing target market of a new product.

**Table 6.** Design Identification

PROCESS	TEAM
Assigning several IKM	Government
Identify IKM profile Identify IKM products and target market Identify IKM competitor Identify IKM production ability	Design

**Design Concept**

This phase is a process of compile data from market data bank (stylus & euromonitor) and analyzed through data from design identification. Final product and technical specification become an output from this phase,

**Table 7.** Design Concept

PROCESS	TEAM
Legal work (mutual of agreement contract with IKM)	Government
Choose new target market (consumer) Define product theme for a new consumer Idea imaged (product image, sketch) Specify geometrical and material specification	Design
Preparing work force	IKM

**Detailed Design**

This process is a preparation before prototyping, contain product technical drawing and legal works.

**Table 8.** Detailed Design

PROCESS	TEAM
Evaluating IKM production ability Estimating product price Evaluating product specification	Design
Prototyping Estimating production cost	IKM

## Final Design

**Table 9.** Final Design

PROCESS	TEAM
Legal work (letter of design certificate)	Government
Transfer design specification to IKM	Design
Receive design specification and letter of design certificate	IKM

## Comparison

This section will compare phases of developing product design between literature and DDS, in table 10 comparing step from first to last and table 11 comparing team who run those phase.

**Table 10.** Step Comparison

Phase	Literature Review	DDS
A	Concept Development Process	Design Identification
		Design Concept
B	System-Level Design	Design Concept
C	Detail Design	Detailed Design
D	Testing and Refinement	Final Design
E	Production Ramp-Up	Final Design

**Table 11.** Team Comparison

Phase	Literature Review	DDS
A	Marketing, Design, Manufacturing, Finance, Legal.	Government, Design, IKM.
B	Marketing, Design, Manufacturing, Finance, Service.	Government, Design, IKM.
C	Marketing, Design, Manufacturing.	Design, IKM.
D	Marketing, Design, Manufacturing, Finance, Sales.	Government, Design, IKM.
E	Marketing, Design, Manufacturing	Government, Design, IKM.

There are different development phase and team adjusted by both purpose. Phases from literature review organically formed by purpose to gaining business profit for enterprise strategies. A team can come from enterprises

organization itself (employees), agencies or other business organization.

DDS program phases formed by ministry strategies to create a “well design” product for realizing government regime policy. DDS program simplified a phase and a team to perform product design development in a short time (6 months). DDS Program team except government is not an government employees, product designers is people who pass from government selection process. From 2010 almost of product designers are design school graduates, work as a freelancer, lecturer, and business owner in product design field. For manufacturing process DDS Program collect local small to medium manufactures that fulfill government standard of developing ability.

## 5. Conclusion

In term of team with interdisciplinary studies DDS program must have human resources who mastering marketing science, finance and sales. Marketing science will analyze market data regarding to government strategies, create references for another team to make a design concept. Finance team will analyze business continuity while sales team will analyze product selling period.

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