Management of Service Innovation Projects: A Case Study from a German Financial Services Provider

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Abstract: The ability to design innovative services is becoming an important capability for organizations in the 21st century. Information technology plays a major role as an enabler for a broad range of innovative services, and IT organizations need to design services in collaboration with business units to address evolving customer requirements. This paper offers an exploratory case study on the application of a design methodology at the intersection of business and IT, focusing on a German financial services provider that sought to develop new IT-based service innovations. The key finding of this case study is that while processes, methods, and tools are important for managing service design, socio-technical aspects such as context, environment, team management, and project setup also are essential for the successful design of innovative services. The current literature provides rudimentary guidance in these areas, yet a thorough description of these factors and their integration into a service design methodology has not yet been documented. Based on the findings of the case study, we suggest further investigation of the roles played by factors such as environment, team management, and project setup, as well as of the ways in which these factors can be incorporated into the creation of methods to facilitate more effective service design.

1 Introduction

Services and the service industry are becoming an increasingly important part of the 21st-century global economy [CS06]. The pursuit of a better understanding of the development of new services has given rise to a new research direction known as Service Science, Management, and Engineering. Several models exist that describe the process of service development and engineering (see for example [KS91][EO96]). These models are narrow in that they focus solely on the service development process and activities and less on the environment in which these process and activities take place. Johnson et. al. effective new service development projects are characterized by their successful use

of and management of enablers such as teams and tools and propose this as an opportunity for future research [Jo00]. This case study contributes toward this research problem by providing insights from a real-world service design project in the financial industry where special attention has been given to the enabling factors such as team constellation, organizational environment and IT infrastructure.

This extension of scope in new service development is necessary because many organizations, especially those that are mature, struggle to develop innovative new services and products due to a lack of access to the resources, processes, and strategies that are needed to spark innovation [DH96] [Le01]. Several studies have suggested that overcoming this obstacle requires a different management approach capable of supporting not only incremental innovation, but also breakthrough innovations in mature organizations [Jo02] [OT04].

The design methodology that we have applied in this case study has its roots in mechanical engineering education and has been practiced for more than 40 years at a leading U.S. engineering school [Dy06] [CL09]. It is an iterative, prototyping, and customer-oriented methodology used to solve problems and develop engineering solutions [Ca07] [Sk08]; artifacts and results that have been realized using this methodology have received several innovation awards [Wi08]. Based on these successes, we have chosen to apply this methodology in a business context, and have transferred it from the mechanical engineering domain to the service design domain. The transfer of an established concept from mechanical engineering to industrialize and professionalize the service development process represents an innovative - and potentially fruitful - solution [Za06] [Wa07].

Additionally, the selection of this methodology contributes to the current discourse of "design thinking" as a new approach for the development and management of innovation [DM06] [Dy06] [Br08]. Here we define design based on the definition advanced by [Dy06], namely, as a "[…] a systematic, intelligent process in which designers generate, evaluate, and specify concepts for devices, systems, or processes whose form and function achieve clients' objectives or users' needs while satisfying a specified set of constraints." Understanding this process is essential in order to improve design praxis. While the first generation of design research leveraged the field of operations research to decompose complex problems into smaller, more manageable components, the second generation of design research shifted toward understanding design as a social process [BB07]. The application of this methodology in an organization provides insight into the social context of design and innovation and contributes to the investigation of how design processes can be improved.

This case study takes as its focus a collaborative service design project undertaken by the business and IT departments of a German financial services firm. The insights gleaned from the case will contribute meaningfully to the literature on service design and innovation in organizations, and will seek to shift the research focus from the current, narrowly circumscribed view, which regards service design as a discrete activity, toward a broader, more holistic view that conceptualizes service design as one component of an organization's overarching innovation framework.

2 Research Methodology and Case Environment

This case study is based on a four-month project within the IT organization of a large German financial services firm that took place from August to December 2009 (binding non-disclosure agreements prevent explicit mention of the firm's name). The project was initiated within the firm's IT unit to develop new IT-based services based on an initial problem definition that was devised by the business department.

The researchers in the current study apply the engineering design methodology described by [CL09] to evaluate its application and usefulness in an organizational context, following the participatory action research approach based on [SE78] [BW96] [CH98]. To do this, we have partnered with the IT unit of a major German financial services provider to create an environment that supports the service design project, as well as our research activities. The researchers acted as coaches and trainers to the design team for the application of the engineering design methodology while at the same time conducting interviews and performing surveys to gather the data necessary to address the research questions.

When designing a research methodology, one crucial decision is determining whether the study will employ a deductive, quantitative approach or an inductive, qualitative approach [HH97]. Because the current study seeks to explore a new research domain, the use of an inductive, qualitative approach such as the case study method [Ei89] [Yi94] [St99] is appropriate.

In order to achieve a high-quality case study design, it is important to consider the issues of construct validity and internal validity [Yi94]. Construct validity refers to establishing suitable operational measures for the concepts that are being studied. In this research, this was achieved by basing the study's questionnaire and analytical framework on previous theoretical and quantitative research, as shown below.

Research Area	Previous Research
Team Configuration: What personality types are necessary for a high-performance design team? What is the configuration of the team? What is the influence of the configuration on the process and project outcomes?	[Mc00] [Kr04] [Kr05] [Sk08] [Wi08]
Perception: How are the specific aspects of an innovation project (insecurities, creativity, ambiguity, etc.) perceived within the corporate environment?	[Ca03] [Dy06]
Success Factors: Which factors within the team and the organization are necessary for a successful project flow and outcome?	[SC99] [Jo00]
Operational Challenges: Which factors within the organization negatively impact the performance of the design team?	[DH96] [KS96] [Le01] [OT04]

Table 1: Literature research on relevant research areas

Internal validity refers to the reliability of a study and whether the variables that have been chosen are sufficient to describe and explain the topic under investigation. To ensure internal validity, we have conducted semi-structured interviews with each member of the design team, as well as with other key community members, after each major project milestone. Altogether, 38 interviews were conducted, recorded, transcribed, and analyzed (20 with the design team and 18 with community members). Second, the design team answered a weekly questionnaire that sought to observe certain parameters and characteristics of the design project; a total of 72 questionnaires were completed by the four design team members over the 18-week duration of the project. Additionally, pertinent observations made by the trainer were recorded in a project diary that was updated on a weekly basis.

3 Service Design at the Intersection of Business and IT

3.1 Prerequisites and Environment

In order to foster an innovation-friendly environment within the case organization, several prerequisites had to be established. Then nature of these prerequisites came from coaches who have previously applied this method in the academic environment and who were able to use their knowledge to recreate a similar environment within the organization.

Defining the Project Proposal

The initial project proposal was based on a solely technical premise, and aimed to developed applications for Microsoft Surface computers. Even though an existing application had already been transferred to this computing platform, the firm's business departments were looking for new approaches to engage customers with this technology. Therefore, the project proposal was shifted from one with a wholly technical perspective toward a broader strategic business perspective.

One challenge for financial services providers is the increasingly prevalent use of self-service technology, which reduces the number of personal interactions between employees and customers. Despite the convenience that self-service options offer, employee-mediated interactions are important to allow employees to identify customer needs and provide a customized, individualized financial advisory experience. Based on this challenge, the following problem statement was defined in the project proposal:

> *How can we stimulate customer interest, allow customers to signal their interest, and then create a unique, customized personal financial advisory experience?*

This problem statement shifted the focus from the technical and business aspects of the project toward the needs and interest of the customer or end-user, creating the basis for a solution that could incorporate both technical improvements and heightened service quality and responsiveness.

Team Selection

The design team consisted of four interns who were recruited using the existing internship recruitment processes in place in the organization. This process is relevant for two reasons. First, the students had no previous design experience or financial services industry experience. Second, the selection of students was based primarily on the firm's existing recruitment guidelines and did not incorporate any specific aspects that have proven to be relevant in the effective creation of design teams.

One such consideration is team diversity. It has been shown that highly diverse teams consistently achieve superior outcomes [Le98] [Wi08]. 'Teamology,' a methodology based on the Myers-Briggs personality test, helps to identify the personality traits and cognitive modes of individuals, and, by following an algorithm, to select members and form teams comprising a broad range of personality types [Wi08].

Table 2 shows the dominant cognitive modes that were present in the design team, according to the Teamology model. It should be noted that while the team incorporates each one of these cognitive modes, no single mode is particularly strongly represented; one dimension (Introverted Thinking/Analysis) is almost completely absent.

	ES	**EN**	**ET**	**EF**	**IS**	**IN**	**IT**	**IF**
	Extraverted Sensing	Extraverted Intuition	Extraverted Thinking	Extraverted Feeling	Introverted Sensing	Introverted Intuition	Introverted Thinking	Introverted Feeling
	Experiment	Ideation	Organization	Community	Knowledge	Imagination	Analysis	Evaluation
Team Member 1	0	5	0	7	0	3	1	0
Team Member 2	0	0	0	0	0	8	0	4
Team Member 3	3	3	3	0	0	0	0	1
Team Member 4	0	0	8	0	14	2	0	8

Table 2: Cognitive modes of design team based on MBTI; maximum score is 20

Project Environment

The various project stakeholders and the relationships between them are depicted in the following illustration:

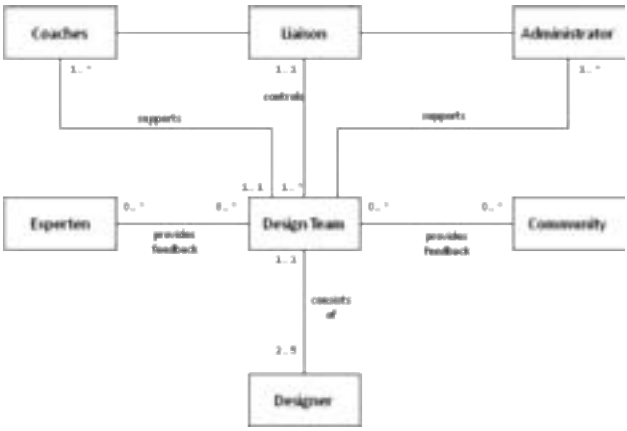

Figure 1: Project Structure and Roles

The design team consisted of four recent graduates who were coached by method trainers to apply the design thinking methodology and to develop solutions to the defined business problem. The trainers also facilitated the dissemination of new concepts and techniques (i.e., ethnography, brainstorming, prototyping, user testing, and problem reframing), since the team members had not previously employed these approaches. The liaison, who functioned as the chief decision-maker that steered the project team and defined the problem statement, also provided feedback about the individual prototypes. The stakeholder group representatives included several employees of the financial services firm with expert knowledge in certain domains (i.e., software development, hardware, market research). Another group of employees formed the largest stakeholder group, known as 'the community,' which provided feedback on the developed prototypes at major project milestones through semi-structured questionnaires.

Infrastructure

Each member of the design team was issued a corporate laptop computer and granted access to the IT resources that are available to every employee in the organization (e.g., remote access, printing, etc.). Additionally, the team was able to use a Microsoft Sharepoint Server for collaboration, as well as an Atlassian Confluence used as a team wiki for documenting the design process. In addition to this IT infrastructure, the team was given office space in the corporate "innovation lab," which was a prototype for a future work environment designed to support collaboration.

3.2 Design Process

This chapter describes the actual design process followed by the team. Based on the engineering design method defined by [CL09], the core design cycle forms the base of the iterative design process and consists of five stages. The fundamental stages of the core design cycle are based on the Innovation process as defined by [Ow98] and adapted by [BB07], and are shown in

Figure 2.

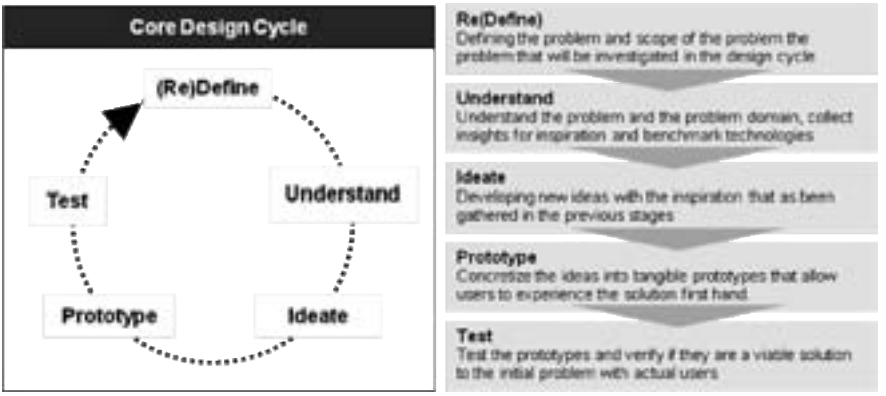

Figure 2: Core Design Cycle and Process Steps in the Core Design Cycle

This design circle is performed continuously during the design process, with a scope that shifts from user research (Understand) and idea generation (Ideate) in the early stages toward prototyping (Prototype) and user testing (Test) in the later stages. The early iterations emphasize divergent questioning, in which the "questioner intends to disclose the alternative known answers and to generate unknown possible ones" [Dy06]. This leads to divergent thinking, where the questioner moves from facts to possibilities with generative design questions. The later prototypes are converging where the questioner asks deep reasoning questions to converge by revealing concrete facts [Dy06]. One essential principle of this approach is to preserve ambiguity during the design process, quelling the tendency to eliminate it and converge toward a particular solution [Dy06]. The core design cycle, as well as the different prototype milestones, are shown in Figure 3, along with the names assigned chronologically to the individual prototypes.

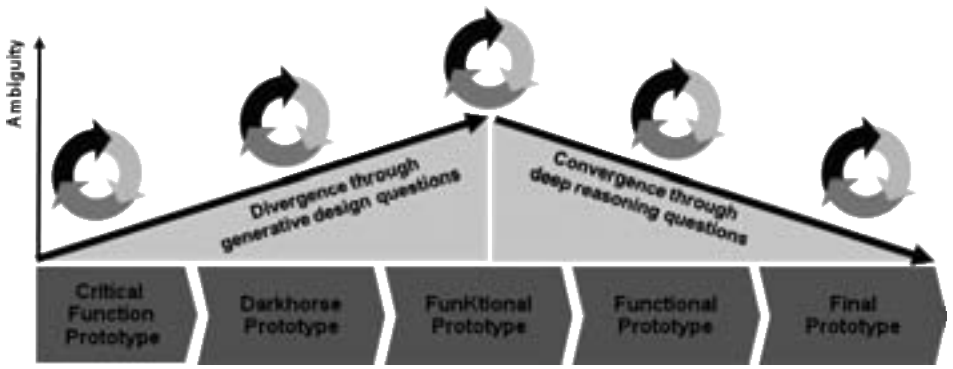

Figure 3: Design Process and Prototype Milestones

In order to elucidate the actual design process and the prototypes that were developed, the following sections explain the prototype milestones in greater detail and provide examples about the interim solutions that were considered over the course of the project.

Critical Function Prototype

The aim of this phase is to better understand the given problem statement and the overall problem domain, as well as to identify the critical functional requirements of a potential solution. Tasks in this stage include seeking to understand customers and their needs and behavior, as well as attempting to understand and screen new technologies and business models as possible sources for idea generation. These activities form the major components of the first stage of the design process and based on the insights gathered in this stage a set of prototypes is implemented to provide solutions to the identified critical functions.

Darkhorse Prototype

After the problem has been addressed for the first time in the critical functional prototype phase, the second prototype phase, the so-called darkhorse phase, allows the design team to restart their approach and pursue a different direction. The motivation for this is twofold. First, it allows the team to address the problem from a different perspective, allowing a broader range of potential solutions to emerge. Second, the darkhorse stage allows design teams to experiment with high-risk solutions that may have been considered too risky in the first phase, but could ultimately provide a breakthrough solution to the problem, as has been the case in countless projects in the academic environment.

FunKtional Prototype

The FunKtional Prototype aims to integrate and combine the different prototypes that have been developed in the previous stage into a coherent, holistic concept or vision statement that acts as the point of reference for the later stages of the design process. This phase also consolidates the customer feedback from the previous stages to ensure that the defined vision meets customer requirements.

Functional Prototype

The Functional Prototype phase marks the milestone when the team defines the scope of the final solution that will be delivered at the end of the project. This prototype is also essential for the internal customer, because at this point of maximum diversification, it is possible to define the cone in which the team should converge.

Final Prototype

The Final Prototype in most cases consists of several other previous prototypes that ultimately are integrated into a coherent concept. The sequential stages of the prototype for the interactive financial advisory services are shown in Figure 4.

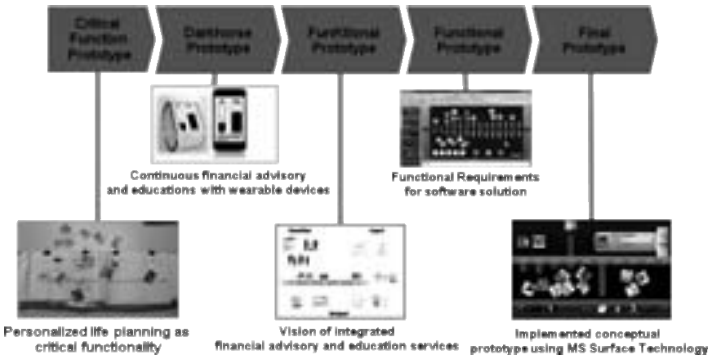

Figure 4: Selection of actual prototypes of the design process

4 Findings

The following sections offer the findings and observations made during the study.

4.1 Team Configuration

Team Member Selection based on Personality Tests not permitted by Law

In order to achieve optimal team diversity, it is beneficial to consider the personality traits of potential team members. However, labor laws in Germany and many other countries do not permit information to be collected about employees that could be used in a discriminatory manner, and Teamology personality assessments could be construed to fall into this category. The information about the interns could only be collected by ensuring the anonymity of the individual team members. Therefore, in some organizations, selecting team members based on Teamology or any other method that identifies individual traits or characteristics is not possible.

Lack of Project Leader puts full Responsibility on the Design Team

Since the methodology did not allow for the designation of a team leader or project manager, the team's decisions had to be determined through lengthy discussions in which all four team members debated each course of action. To outsiders, this approach appeared to be inefficient and unnecessarily lengthy, but team members reported that the extensive discussion helped them to identify the best potential solutions. Furthermore, we observed that this process resulted in greater consensus and support of the team's final decisions, a finding that was confirmed in the interviews and that may have important implications for coaches or managers supporting team projects.

Existing Recruitment Processes tend to eliminate Candidates needed for a diverse Team

To some extent, the interns who participated in the project shared similar personality traits, educations, and backgrounds, with the notable exception of the mechanical

engineering student who represented something of an anomaly; existing recruitment processes in place at the firm render it difficult to assemble a truly diverse team. During the project, it was observed that the team experienced difficulty generating truly radical ideas and concepts; instead, they hewed to a more conservative approach to problem solving. This may be attributed to the fact that none of the team members possessed dominant extroverted, intuitive and imaginative personalities. Additionally significant coaching was necessary to induce the team members to conduct user research and to perform user testing in various public locations.

4.2 Perception

Different understandings of innovative Environments

One salient observation made during this project is that different stakeholders in the organization harbored a wide range of perceptions about what it means to work in a creative, innovative environment. In this project, it was observed that the once-orderly office devolved into a somewhat chaotic environment full of sticky notes for brainstorming and toys and tools for prototyping. If certain stakeholders are irritated by this approach it is the responsibility of the bridgehead to communicate the characteristics of the design methodology and ensure the support of this stakeholder. Otherwise the support for fostering such an environment could erode and negative attitudes can emerge.

Embracing radical new Ideas

Typically, the darkhorse prototype stage allows the design team to explore breakthrough ideas and radical solutions without being beholden to traditional strictures, norms, or paradigms. However, we observed that this design team was hesitant to push the boundaries of their imaginations too far, due in part to the fear that their ideas might be considered too radical or visionary. Significant encouragement from the trainers was necessary to ensure that the team afforded sufficient consideration solutions that broke with existing assumptions.

4.3 Success Factors

Integration of Business Departments

A clearly defined role for the project owner, the liaison, is an important project success factor. From defining the initial problem, to guiding the team through each phase of the design process, to ensuring that prototypes satisfy the organization's needs, the input of the project owner can significantly influence the outcome of the design process. The presence of a business-oriented project owner proved beneficial in this project; in contrast to the unwieldy "steering committee" approach used in many collaborations between business units and IT departments, the strong leadership influence of the business unit in this project helped to ensure that the final product was well-aligned with the organization's strategic goals.

Prototypes create a common Language between different Stakeholders

Most work teams' members have been drawn a variety of disciplines and backgrounds. This is especially true at the intersection of business and IT. Although there are many advantages associated with diverse teams, interdisciplinary communication can sometimes be a problem. In this study, it was observed that tangible prototypes create a common language and provide the basis for improved communication between different stakeholders. This was particularly evident when delegations from other countries or cultures visited the innovation lab - the tangible prototypes provided a common touchstone for discussion.

Project Rooms

Although it may seem to be an incidental factor, the physical environment in which collaborative innovation takes place can beneficially impact project outcomes. The "innovation lab" that served as the backdrop for this project seemed to play a significant role in fostering a successful project outcome. The team's ability to modify the setting to facilitate innovation, creative discovery, and collaboration also proved to be important. The team also used the room to display the prototypes, ensuring that visitors to the space could view the models and offer feedback, even on short notice.

Bridgehead

A major part of the success of this project can be attributed to the activities of the administrative bridgehead who acted as the connector between the design team and the rest of the organization. The activities of the bridgehead included the facilitation and preparation of infrastructure, as well as the management of daily operations and organizational communications for the design team. However, budget management proved to be a formidable challenge for the bridgehead; a dedicated budget was not allotted to the design project, so many procurement processes were delayed; in some instances, project team members and trainers were forced to cover expenses out-of-pocket.

4.4 Operational Challenges

Traditional corporate IT Infrastructure not sufficient for radical Collaboration

The laptop computers provided to the project team were equipped with the standard IT applications available to every employee in the organization. However, it soon became clear that these computers were not sufficient to perform some of the tasks in this project (e.g., photo editing, video editing, animation creation). In addition, the available document editing and file sharing tools did not support the radical collaboration work style that the design team was called upon to use. This lead to a situation in which the design team members had to use their personal laptop computers, circumventing the corporate IT system through ad-hoc wireless networks to quickly share large files and use software that is not included in the organizations application portfolio.

Concerns regarding wrong Focus or Lack of Focus

Community members who had a close relationship to the design team sometimes expressed concerns about the team's focus, albeit indirectly and often without providing specific examples. Nevertheless, by dint of the questions, comments, and discussions between the bridgehead and members of the community, it was revealed that some regarded the team as being insufficiently goal oriented. However, it is important to note that inspiration can come from any source and in many instances, innovation proceeds along a lateral, associative, and/or non-linear course. If a design team is dissuaded from exploring seemingly unrelated areas, the essence of an open innovation culture can be destroyed.

Breakthrough Innovation vs. Meeting predefined Goals

One area that has been subject of much discussion in recent years is the trade-off between achieving pre-defined business goals and clearing the path to allow radical new innovations to emerge. In the case project, several concepts and prototypes were discarded because the liaison stated that while they were important, they did not necessarily contribute toward the organization's stated objectives. These ideas have not been pursued further, despite the fact that with additional effort, they may have evolved into radically new concepts and service offerings.

5 Discussion and Conclusions

From an organizational perspective, the project has been deemed a success, having achieved an outcome that exceeded initial expectations. Based on the result of this project, management has decided to pursue additional projects using the design-thinking approach, with the goal of building up the necessary knowledge to oversee similar undertakings within the organization; this indicates that the design-thinking approach has the potential to bring significant value to an organization seeking to increase its innovative capacity.

The findings need to be discussed in relation to service design in an organizational context. Past research has often focused on the process, activities, and tools used to design new services and research opportunities to explore enabling factors for service innovation projects have been defined. The current results indicate that the context and environment in which these services are designed are as important as the process itself. Therefore, the scope of service design management should be broadened to include more than just processes, activities, and roles. The case study has shown that while the activities of user research, ideation, and prototyping are important, breakthrough innovations can only emerge by creating the right environment, assembling a well-composed design team, and motivating and leading the design team according to protocols designed to facilitate optimal performance. Traditional project management approaches might not be suitable to create the environment that enables a successful new service development project.

Since the environment in which innovation occurs is of high importance, the framework and methods employed in service design and service design management need to address social, physical, and other environmental factors that foster innovation. This is especially important when a large and mature organization is seeking to pursue innovation, due to the other factors that tend to hinder radical breakthroughs in such an environment. One future research question should center on whether this should be done in a top-down manner by defining management concepts for service design, or in a bottom-up manner by extending existing service design/project management models and frameworks to address environmental and other factors.

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