The Harada Method – A Method for Employee Development during Production Ramp Up

M. Goerke, J. Gehrmann

Abstract—Caused by shorter product life cycles and higher product variety the importance of production ramp ups is increasing. Even though companies are aware of that fact, up to 40% of the ramp up projects still miss technical and economical requirements. The success of a ramp up depends on the planning of human factors, organizational aspects and technological solutions. Since only partly considered in scientific literature, this paper lays its focus on the human factor during production ramp up. There are only incoherent methods which address the problems in this area. A systematic and holistic method to improve the capabilities of the employees during ramp up is missing. The Harada Method is a relatively young approach for developing highly-skilled workers. It consists of different worksheets which help employees to set guidelines and reach overall objectives. This approach is going to be transferred into a tool for ramp up management.

Keywords—Employee Development, Harada, Production Ramp Up.

I. CURRENT SITUATION

MANY companies face heightened pressure of competition in the face of advancing globalisation. This has resulted not only in a price war but also in a competition of new technologies and products. Ultimately, this situation leads to increasingly short product life cycles, accompanied by a reduction in the amount of time available for new innovations to be launched on the market [1]. As a result, more and more importance is being attached to the production ramp-up phase, as a link between the development and serial production phases, hence making it a competitive factor of central significance [2].

Despite the major importance of ramp-up management, a study from 2004 showed that only about 40% of all ramp-up projects conducted at European automobile parts suppliers were successful from an economic and technical point of view. The remaining majority of 60% of ramp-ups failed for either technical or economic reasons [3].

The problem of being unable to meet the technical and economic requirements of ramp-ups, despite their importance, shows that there is still a need for action with regard to the way they are managed. The success of a ramp-up is determined by the form of the human, technological and organisational factors involved, as well as their interrelations,

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whereby the human factor is of the greatest significance [4]. For this reason, the human factor is considered one of the main fields of action to be taken into consideration in ramp-up management when it comes to achieving success under prevailing market conditions [5]. It must be noted, however, that to this day, no satisfactory solution has been found for a field of action relating to the human factor, which only serves to further increase the need for a course of action.

II. THE PROBLEMATIC HUMAN FACTOR

There are numerous reasons for the lack of success experienced in ramp-ups. Table I below lists the various disturbance factors that are involved; these have been subdivided into categories [5], [6].

TABLE I
DISTURBANCE FACTORS AFFECTING THE RAMP-UP PROCESS

Supplied parts	Employees	Equipment	Production/ project space	Services	Information
Supply delays	Scheduling delays	Lack of availability	Deficiencies in equipment	Quality control loops not implemented	Data incorrect or not available
Product changes	Personnel bottlenecks	Insufficient quality	Scheduling delays	Logistics system not initiated	Scheduling delays
Insufficient maturity	Lack of motivation/ qualification	Programming errors	Lack of transparency	Scheduling delays	Experiential knowledge not available
Deviations in quantity Quality deficiencies	Lack of experience	Scheduling delays Compatibility problems	Space bottlenecks	Quality deficiencies	Planning errors

In the study 'fast ramp-up – schneller Anlauf von Serienprodukten' [5], five fields of action were identified to reduce disturbance factors during the ramp-up phase and increase the success of the ramp-up process.

Planning, controlling and organising ramp-ups
1. Ensuring production systems are robust for ramp-up
2. Change management
3. Cooperation and reference models
4. Knowledge management and qualification of personnel involved

A common factor of four of these five action fields is that they all require consideration of the human factor. In the first field of action, the organisation of ramp-ups necessitates an interplay between various partners, i.e. people [7]. The second requires employees to acquire the appropriate methodical qualification for conducting a ramp-up, since a suitably robust production system can only be created by adequately qualified

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and capable personnel [7]. The fourth aspect refers mainly to a cooperation model that is intended to secure both the horizontal and vertical cooperation of all partners involved in the ramp-up [7]. Here too, it is not possible to ignore the human factor. The final field of action underlines the significance of the human factor in the ramping up process, since it is here that a course of action is expressly indicated for this factor. This action field includes knowledge management that relates specifically to the ramp-up and addresses all departments and areas of the organisation. It also includes the aspects of employee motivation and qualification [5], [7].

For the reasons stated above and due to the aforementioned disturbance factors, it is evident that people have a great impact on the ramp-up process. When one considers the role of the human factor somewhat more closely, a number of different causes of ramp-up failure can be identified; these can be condensed into eight problem areas, as summarised in Table II. [4]-[6], [8]-[12].

TABLE II
PROBLEM AREA: THE HUMAN FACTOR

Problems associated with the human factor
Frustration caused by multitasking
Ability to respond quickly and self-reliantly
Creation of a constructive ramp-up culture
Lack of personnel availability
Qualification of employees involved in the ramp-up
Motivation of employees involved in the ramp-up
Consideration of social and human aspects
Regularity of communication

This overview shows how diverse the problem fields are in relation to the human factor. Reducing these problems requires an improved command of the ramp-up phase. There are already a number of approaches in ramp-up management that address these problem areas. These will be presented in detail in the following.

This will be followed by a presentation and investigation of the Harada method, which is a new and comprehensive procedure that aims to reduce problems resulting from the human factor.

III. EXISTING APPROACHES RELATING TO THE HUMAN FACTOR PROBLEM

Occasionally, ramp-up management makes use of methods that have been devised for the purpose of enhancing the integration of persons in the ramp-up process. Of particular relevance are the Ishikawa diagram, lessons learned workshops, the listing of open points, and regular communication; these will be discussed briefly.

The Ishikawa diagram is a compact method of illustrating the interrelations between problem triggers in various groups and their subsequent effects [13]. It makes it possible to identify problems encountered in the context of the human factor in a systematic and structured manner.

The aim of lessons learned workshops is to reflect on the experience made in the course of the run-up process, with the aim of learning from the experience and conveying it to other employees. This is useful as it allows any negative experiences identified to be avoided in future and positive experiences to be repeated [3].

To maintain an overview of the tasks that can be derived, for instance, from the Ishikawa diagram, it has proven expedient to draw up an ongoing list of open points in ramp-up management. Among other things, it indicates a task's status and who is responsible for it; moreover, it helps people to focus [14].

Communication is the most important element in project management and is consequently of great significance in a ramp-up project. In line with its significance, the method of regular communication is used to establish routine communication as a good habit and a matter of course [15].

By mirroring the characteristics of the methods just stated with the identified problem fields relating to the human factor, it becomes clear that the interplay between the existing methods address a large number of the problem areas. Exceptions are the lack of employee availability and the ability to react quickly and self-reliantly; these can barely – if at all – be covered by the Ishikawa diagram. If one considers the methods independently of each other, the ability to have a positive impact on the problem fields appears much less likely, because taken alone, they are only able to cover a small number of problem areas. Consequently, even if the methods presented already cover several problem fields, there is still a need for further methods that can help to resolve these problem fields. This is based on the assumption that the more methods exist with a positive effect on a problem area, the easier it will be to resolve it. Moreover, there are two problem fields that are not addressed at all, or at best only partly; it is therefore vital that they are taken into consideration in the requirements for new methods. These statements are summarised in Fig. 1.

Method	Qualification of employees involved in ramp-up	Motivation of employees involved in ramp-up	Consideration of social and human aspects	Regular communication	Frustration of multitasking	Speed and self-reliance of response capacity	Creation of a constructive ramp-up culture	Lack of personnel availability
List of open points					x			
Lessons learned workshop	x		x				x	
Ishikawa diagram						(x)		
Regular communication	x	x	(x)	x			x	

x : Can have a positive effect on a problem field
(x): Slight positive effect

Fig. 1 Problem areas that can already be influenced

It is evident from the investigation of the existing ramp-up management and its effect on the problem areas, that there is a need for a further course of action. This can be applied specifically to the following nine requirements for new methods.

These requirements arise in turn from the three

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requirements areas, the first one being the goals of the ramp-up management. To accelerate the ramp-up phase, ramp-up personnel must be able to react faster and with greater self-reliance. With regard to the cost goal, a new method must be simple, structured and expedient in its form. Secondly, the requirements are derived from the problem fields described. The aim is that a new method of ramp-up management should satisfy the eight problem areas in the human factor outlined here. Due to the fact that the ability to act fast and with self-reliance and the lack of employee availability are not fully addressed by any of the existing methods, these two requirements should be given a somewhat greater weighting. Thirdly, requirements can be derived from the general requirements for new methods (Fig. 2).
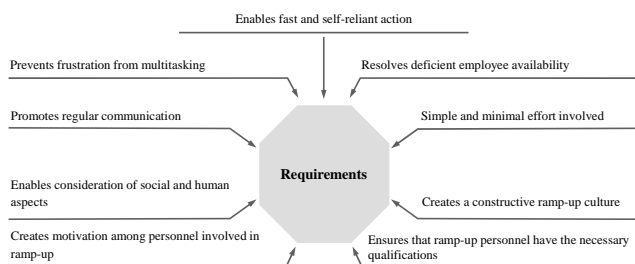

Fig. 2 Requirements of new ramp-up management methods

One possible new approach that can be taken to satisfy the derived challenges and to amend or replace existing methods is the Harada method.

IV. THE HARADA METHOD

The Harada method was selected by a research group from the Japan Management Association, which is composed of senior managers and advisers, as the best method in the world for day-to-day management. It is regarded as the most promising way of making people more self-reliant and allowing them to develop their full potential. Personal development and conscious goal attainment enhances the enjoyment of work and ultimately leads to an increase in business success [16].

TABLE III
THE FIVE WORKSHEETS IN THE HARADA METHOD

Worksheets in the Harada method
33 Questions for Self-Reliance
Long-Term Goal Form
Open Window 64 Chart
Routine Check Sheet
Daily Diary

The basic framework of the Harada method consists essentially of five worksheets (see Table III). The Harada method consists of working through these worksheets step by step. They enable people to find their goal very simply and to define the necessary activities. They also serve as a guardrail that prevents users from deviating from the path that leads to their goal. With regard to some questions, however, it is also possible to use the worksheets individually and separately

[16].
The five worksheets summarised in Table III have the following aims and functions:

A. 33 Questions for Self-Reliance

The aim of the 33 questions for self-reliance sheet is to estimate the independence and ability of the person. It is not used for assessment purposes; its aim is merely to indicate which of the 33 points constitute potential for improvement.

B. Long-Term Goal Form

The long-term goal form is the central document of the Harada method [16]. The main purpose of the sheet is for the user to perform four different tasks. First of all, it can be the basis by which to subdivide the set goal. Secondly it can be consulted to check the sense and purpose of the set goal. Thirdly, a self-analysis from the past is performed from which possible obstacles and possibilities of deviating from the path towards the goal can be derived. Fourthly, it may be of assistance in implementation planning.

C. Open Window 64 Chart

The open window 64 chart allows the user to generate the steps and activities that are necessary to achieve a selected goal. The result should be eight task fields each with eight activities; these activities may comprise single tasks or routine activities.

D. Routine Check Sheet

The aim of the routine check sheet is to monitor the generation of positive behaviours that are conducive to character formation and goal attainment. The daily check enables daily comparisons to be made of the work performed and provides a simple and clear means of checking at the end of the month whether the planned routines really have been implemented [16]. This in turn makes it possible for both the user and the manager to check that the employee is indeed on the way towards achieving his goal.

E. Daily Diary

The main aim of the daily diary is to support the user in attaining his goal on a daily basis. It gives the user a means of conducting a precise daily schedule while keeping sight of his central tasks. The daily diary also aims to provide a means of reflection, in addition to providing sufficient space for notes and future tasks. In this way, it allows the user to learn from mistakes and difficulties, in the hope that these can be avoided in future.

To facilitate users in successfully working through the five sheets, the Harada method is divided into five steps. The first is to define the goal, and this is followed by questioning the sense and purpose of that goal. Once these two steps have been successfully completed, an analysis phase follows, in which past successes and failures are assessed with the aim of identifying possible future obstacles and, correspondingly, ways of avoiding them. The fourth step consists of working through the 64 fields and routine check sheets in planning for goal attainment. Finally, the user's daily implementation of the

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Harada method is recorded in the daily diary.

The five steps of the Harada method are:

1. Goal – setting the goal
2. Purpose – questioning the sense and purpose of the set goal
3. Analysis – understanding your own successes and failures
4. Planning – drawing up a future action plan
5. Implementation – implementing the action plan on a daily basis

V. COMPARISON WITH EXISTING METHODS

Following on from the introduction and the description of the procedure and structure of the Harada method, there follows an initial comparison of the nine requirements to new ramp-up management methods.

A. The Method Enables Fast and Self-Reliant Action

The core objective of the Harada method is to enable employees to act with more self-reliance. They themselves should set their own goal and determine, with the aid of the open window 64 chart, what activities and routines are necessary to achieve their goal; they should then perform these, along with the daily diary. Based on the fact that each employee chooses his own goal independently and pursues it by means of activities and routines, it can be assumed that he will become more independent. It can also be assumed that the more he makes his own decisions independently, the more quickly he will be able to do this in future, since he will have developed a certain level of routine. It can be concluded from the first interim comparison that the Harada method is fully able to meet the first requirement.

B. The Method Resolves the Problem of Insufficient Employee Availability

Multiple employee qualification provides an indirect means of increasing employee availability. In this case, it is possible to counter the lack of available employees by using the Harada method.

With respect to the second requirement, it can be concluded that the user's own interest in increasing his level of qualification is random in nature. Accordingly, it is possible that he has not planned to take part in any further training in order to achieve his goal. For this reason, it should be noted that the Harada is only able to slightly satisfy the second requirement.

C. The Method Is Simple and Can Be Performed with a Low Level of Effort

The entire Harada method is of moderate difficulty and can be performed with a moderate level of effort. The detached application of individual worksheets on the other hand is very simple and only requires a low level of effort. For example, the open window 64 chart can be very easily employed in a large group for the systematic formulation of activities and routines aiming towards reaching one's goal. The same applies to the routine check sheet and daily diary, which can be both be used individually.

With regard to the third requirement, it can be concluded

that the application of the individual worksheets fully satisfy the requirement, although when applying the entire Harada method, small compromises must be made due to the higher level of effort involved.

D. The Method Creates a Constructive Ramp-Up Culture

To begin with, in addition to giving support in the application, performance of the full Harada method necessitates a several-day workshop, in which all future Harada users in the company must take part. When working through the sheets and in particular when performing the sense and purpose check for the selected goal, it can be assumed that users will reflect on how their behavior affects other departments and colleagues.

Based on this assumption, it can be determined that the Harada method partially satisfies the fourth requirement.

E. The Method Ensures that Ramp-Up Personnel Have the Necessary Qualifications

In most cases, employees must undergo further training in order to be able to attain their independently selected goal. The great advantage of this here is that the training takes place voluntarily, for which reason it can be assumed that it will be considerably more effective than a training measure ordered from above. Furthermore, employees can react faster to qualification deficits, because the individual employee knows better than anyone what types of training he urgently requires and what types are not necessary to attain his goal. It is clear that the Harada method fully satisfies this requirement and that it ensures ramp-up personnel obtain due qualification.

F. The Method Creates Motivation among Personnel Involved in Ramp-Up

Based on the fact that the goal striven for in the Harada method is determined by the employee himself, it can be assumed that he will have a high level of intrinsic motivation towards reaching this goal. It can therefore be said that the Harada method fully satisfies the sixth requirement and creates increased motivation during ramp-up.

G. The Method Enables Consideration of Social and Human Aspects

In the Harada method, every user chooses his own goal as well as the attendant routines and activities required. This ensures that the user is aware of his wishes and preferences. If he shares these with his colleagues, it is considerably easier to consider the social and human aspects involved in ramp-up management. It cannot, however, always be ensured that the user will share his personal preferences with colleagues. For this reason, the Harada method can only be said to largely satisfy the seventh requirement.

H. The Method Promotes Regular Communication

At first glance, the Harada method does not seem to promote regular communication in the company. However, this aspect can be positively influenced in two ways. Firstly, the user can create a routine of actively communicating more frequently. However, this would merely be a chance product

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and it cannot be assumed that it will be the case. The second possibility arises from the fact that within the Harada method, attention should be paid to praising other people whenever it is called for and in the right context. This form of communication conveys little information but has a very positive effect.

On the basis of the two ways in which the Harada method promotes communication, it can nevertheless be said that it partially satisfies the eighth requirement.

I. The Method Prevents Frustration from Multitasking

With the aid of the daily diary, the user can draw up a daily Top 5 list of his most important tasks. This creates a basis by which the frustration of multitasking can be avoided. It should of course be noted that the user must endeavour to perform his tasks with as little interruption as possible; by means of daily reflection, the user can become aware of why he was unable to perform intended tasks.

It is clear that the daily diary sheet can have a decisive effect on countering the frustration produced by multitasking; hence the Harada-method fully satisfies this requirement.

Requirement	Degree of fulfilment
Enables fast and self-reliant action	●
Resolves deficient employee availability	◔
Simple and minimal effort involved	◑
Creates a constructive ramp-up culture	◑
Ensures that ramp-up personnel have the necessary qualifications.	●
Creates motivation among personnel involved in ramp-up	●
Enables consideration of social and human aspects	◑
Promotes regular communication	◑
Prevents frustration from multitasking	●

● = Requirement fully satisfied   ◑ = Requirement partially satisfied   ○ = Requirement not satisfied
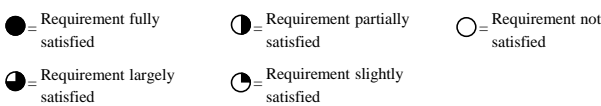◕ = Requirement largely satisfied   ◔ = Requirement slightly satisfied

Fig. 3 Interim comparison of Harada method with requirements

Fig. 3 once again shows the results of the interim comparison of the Harada method with the requirements of new ramp-up management methods. This initial interim comparison clearly shows that with a high level of probability, the Harada method satisfies the requirements of ramp-up management, particularly when taking into consideration the fact that several reasons for failure of a ramp-up are associated with the human factor. Hence the Harada method is able to play a considerable role in enhancing this factor.

VI. CONCLUSION AND OUTLOOK

The human factor can be identified as a central field of action within the framework of ramp-up management. Its impact has a determining effect on the success of the ramp-up phase and therefore deserves particular attention. Methods already exist by which to integrate people and their knowledge and experience in the ramp-up process; however they only cover a part of the problem fields identified. It is therefore necessary to provide additional methods. The Harada method represents one possible approach to resolving this problem. A first interim comparison with defined requirements shows that the approach is able to resolve many of the problem fields encountered. The concrete implementation of the method as an integral part of ramp-up management must be investigated for its practicability. Moreover, necessary modifications must be identified. This will form the object of further research activity.

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