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# Worker mobility and training in advanced manufacturing

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## Abstract

Worker training is a priority for manufacturing organizations, and State and Federal policymakers in the United States. There is a need among US manufacturing industries for a training process plan, including information on what to train the worker in given the changes in product, process, and system-level technologies, and how best to deliver such training at minimal cost. Also, from the viewpoint of the manufacturing worker, possession of transferable skills is commonly expected to provide the worker flexibility and mobility. The objectives of this paper are to examine the issues involved in generating such a training plan, and suggest a framework for generating such a plan. A case study illustrating application of elements of the training framework is also presented.

## Relevance to industry

Manufacturing industry can use the framework presented in this paper for development of effective training plans (both in terms of cost and technical effectiveness) so that workers are ahead of constant technological changes in manufacturing.

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## 1. Introduction

“...If we are obliged to lay men off for want of sufficient work at any season we purpose to so plan our year’s work that the layoff shall be in the harvest time, July, August, and September, not in Winter. We hope in such case to induce our men to respond to the calls of the farmers for harvest hands, and not to idle and dissipate their savings. We shall make it our business to

get in touch with the farmers and to induce our employees to answer calls for harvest help.”

The above quotation is from an interview New York Times conducted with Henry Ford in January 1914. The issue addressed in the interview, namely, finding alternative work for workers who are laid off due to want of sufficient work, remains important and urgent even today. According to the Bureau of Labor Statistics’ recent data on workers who had 3 or more years of tenure on a job they had lost or left between January 1995 and December 1997 because of plant or company

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Table 1

Displaced workers by occupation of lost job and employment status in February 1998 (Data refer to persons who had 3 or more years of tenure on a job they had lost or left between January 1995 and December 1997 because of plant closings or moves, insufficient work, or the abolishment of their positions or shifts)

Occupation of lost job	Total (in thousands)	Total (%)	Employed (%)	Unemployed (%)	Not in the labor force
Total	3578	100.0	75.9	10.0	14.1
Precision production, craft and repair	391	100.0	88.3	5.3	6.5
Machine operators, fabricators, and laborers	343	100.0	55.9	21.0	23.0

closings or moves, insufficient work, or the abolishment of their positions or shifts, nearly 28% of the 3578 thousand displaced workers were manufacturing workers (both durable and non-durable goods manufacturing). Among the different durable goods manufacturing industries, nearly 33% of the 121,000 displaced workers in the machinery tool manufacturing industry were either unemployed or not in the labor force in February 1998. Nearly 36% of the 95,000 displaced workers in the transportation equipment manufacturing industry were either unemployed or not in the labor force in February 1998. These numbers were nearly 40% (of the 86,000 displaced workers), 56.9% (of the 109,000 displaced workers), 20% (of the 81,000 displaced workers) 40% (of the 39,000 displaced workers) in the food and kindred products manufacturing industry, the apparel and other finished textile product manufacturing industry, the printing and publishing manufacturing industry, and the rubber and other miscellaneous plastics products manufacturing industry, respectively. Table 1 provides recent Bureau of Labor Statistics estimates on displaced workers classified by occupation of lost job and employment status of the worker in February 1998.

As can be seen from the table, nearly 21% of all displaced workers were either precision production, craft and repair workers, or were machine operators, fabricators and laborers. In addition, a large proportion of these workers also were unemployed or could not participate in the labor

force. Table 2 is a summary of data on the full-time earnings of manufacturing workers who were reemployed (after losing their previous jobs between January 1995 and December 1997 because of plant or company closings or moves, insufficient work, or the abolishment of their positions or shifts) in February 1998. It is evident from Table 2 that among all US industries, not only were the highest percentage of displaced workers from the manufacturing industry, but also, that manufacturing workers were the ones whose immediate second jobs paid them the least (including the number that only made more than 20% above previous earnings, if above) compared to workers from all other industries who were reemployed.

Compounding the problem is the fact that the data presented do not indicate the nature of the second job for manufacturing workers who found employment—it does not indicate if they found employment in manufacturing (which means they perhaps will get to use all the skills that they built in their previous job), or in some other industry (which will impose an additional burden on the new employer to train the person in the industry practices, and an additional intangible burden on the worker to have to let go of the previous skills and learn new skills).

In summary, while many developments, chiefly technological, have taken place since 1914 in US manufacturing, manufacturing industries, to this day, continue to lay off workers in large numbers. *Active* provision of alternative work for such workers is the theme of this paper. An *active*

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