The Impacts of Automation

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☰	**WHAT'S COVERED**

From textiles to food processing, examples of automation can be found in virtually every industry. Examples of automation may be fairly obvious in some industries, but they are not so obvious in the computer industry. However, automation has had a huge impact in computer industry areas such as software development, due to the utilization of highly repetitive processes. In this tutorial, we will discuss the trade-offs between automated processes and manual processes, as well as the overall impact of advanced computing on employment.

Our discussion will break down as follows:

1. Automated Processes vs. Manual Processes

Recall that business processes are the processes focused on achieving goals for business. Business processes can be classified as either automated or manual. **Automated processes** are completed automatically with assistance from information technology, such as computer hardware, or software with minimal human interaction. Conversely, **manual processes** are those completed solely by a human. It can be said that a successful software project is the result of successful implementation of both automated and manual processes. Project managers need to be aware of when using an automated process would be more beneficial than using a manual process or vice versa, based on factors such as human resources, budget, and schedule. For example, testing is a crucial phase of any software project that, depending on the size and scope of the project, can take a great deal of time, money, and resources away from other phases of development. Faced with this, a project manager may choose to automate the testing process, as it will free up resources for other aspects of the project overall. However, the project manager must also be aware of the trade-offs. In this example, automating the testing phase may have an impact on the overall quality of the application. Automated testing relies on identifying patterns in code errors, and if the pattern isn't recognized, automated testing will not catch it. In this case, manual testing by a human is more accurate, because the human eye will have a better chance at identifying and fixing these errors.

Below is a table that lists some manual and automated development processes and their pros and cons.

Automated Process	Manual Process
--Saves time because automated processes such as testing can be scheduled --Saves time and human resources due to testing	--Quality assurance may be compromised due to the fact that no human is involved with testing --Manual test may not be accurate due to human error. Test may have to be altered or repeated

processes being very accurate and reliable --May require large budget to be allocated to information technology purchase(s) needed to complete testing --Automated testing should be used when the test has to routinely run	costing more money --Takes a great deal of time to perform all tests --Investment required for technology that humans will use to perform manual process --Should be used when only one or two tests are needed

To illustrate the pros and cons associated with the automation of a process, consider the following example.

IN CONTEXT

One of the primary reasons a business or organization uses a call center is for customer service. In most instances, employees working in call centers are tasked with using a number of different software applications and systems to perform a high volume of fairly simple, routine, and repetitive work.

When a customer calls in, a customer service representative has to navigate multiple software applications, while attending to the customer in a manner that will ensure a positive customer experience. If the customer uses an email message to contact customer service, the customer service representative then has to extract data from the email message and enter it into the business's information system. For a business, having its employees continually shifting between screens, software applications, and systems can be slow, inaccurate, and frustrating. If the customer service representative is on the phone with a customer, it can be very easy for the focus of the call to be distracted from the customer to managing multiple applications and repetitive tasks.

Equally frustrating are situations in which customer service representatives have to solicit the same information from customers repeatedly, due to multiple systems requiring the same information (i.e. personal identification numbers). If the customer service representative has to update customer records, the call can be twice as long, thus negatively impacting the customer service experience and the perception of the business held by the customer. To alleviate this issue, many businesses and organizations have automated some of the tasks required of the customer service representative, such as customer identification verification, updating records, answering billing questions, and managing incidents.

Automating these tasks ensures that they are done efficiently and consistently during business hours and after hours. Automating these tasks also allow for I.T. departments to connect separate applications and systems into a single customer service virtual environment, that can then provide the customer service representative with accurate information in real time. In the long run, these benefits can improve the quality of customer service the business offers its customers. These benefits also increase profit, due to less money needing to be spent on having enough employees to handle the volume of calls. The business will also save money on the time it takes per call to resolve an issue.

📄 TERMS TO KNOW

Automated Processes

Processes that are completed automatically with assistance from information technology, such as computer hardware, or software with minimal human interaction.

Manual Processes
Processes completed solely or primarily by a human.

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2. Advanced Computing and Employment

The impact that advanced computing applications, such as automation, have on the labor market is a subject that has been examined quite extensively for several decades. Many people believe that the employment market may be negatively impacted as automation, artificial intelligence, cloud computing, and other advanced computing applications become more commonplace in business. For example, a widely-held belief is that automation will result in the loss of jobs. Whether or not this proves true, automated processes lessen the need for manual labor or employees to perform routine tasks. On the other side of this argument lay those who feel that automation will lead to a resurgence in hiring, as there will be an increased demand for a new type of skilled worker. As an example, robots can be used to perform tasks — such as welding a car door — that at one time required human labor. While the robot may replace the human worker, therein lays an opportunity for the human worker to develop the skills needed to maintain the robot, thereby creating a new skilled position for the human being. Similar to automation, artificial intelligence makes it possible for machines to perform jobs once completed by humans. Artificial intelligence has already had an impact in the mobile computing robotics, gaming, security, and transportation industries, to name a few. The potential for some job loss exists at the same rate as the potential for job creation to occur. Summarily, some of the impacts that advanced computing has on employment are as follows:

- Employment market may be negatively impacted due to loss of human jobs
- Lower need for human employees to perform routine low skilled labor
- Increased need for specialized skills in workforce

☑ SUMMARY

Advanced computing applications, such as automation, offer a great deal of flexibility for humans who work in process-driven situations. In this tutorial, we discussed how **automated processes** differ from **manual processes** and the trade-offs associated with these processes. We also discussed the impact of **advanced computing on employment**.

Source: Derived from Chapter 8 of "Information Systems for Business and Beyond" by David T. Bourgeois. Some sections removed for brevity.
https://www.saylor.org/site/textbooks/Information%20Systems%20for%20Business%20and%20Beyond/Textbook.html

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