Illuminate NEBRASKA
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SOURCING COMPONENTS

# MOVING AWAY FROM KITS

**CONCEPT** Moving away from kits in sourcing robotics components can have significant advantages for robotics enthusiasts and professionals alike. Kits can be limiting in terms of customization and often come with predetermined designs and functionalities that may not fully align with a user's specific needs or preferences. By sourcing individual components, users have the freedom to select parts that best fit their project requirements, including size, weight, power consumption, and interface compatibility. It can often be more cost-effective than purchasing pre-made kits, and can encourage greater learning, creativity and innovation.

## BACKGROUND

In the early days of robotics, enthusiasts were limited to kits, as individual components were unavailable or difficult to find. However, as robotics technology advanced, and component prices became more affordable, enthusiasts were able to source individual components for their projects. The rise of online retailers and specialty electronics stores has made it easier than ever for people to source individual components for their robotics projects, leading to a growing community of hobbyists and professionals who are pushing the boundaries of robotics technology through innovation and creativity.

## REAL WORLD CONNECTIONS

University of Nebraska-Lincoln's robotics team, Husker Robotics, competes in the annual NASA Robotic Mining Competition, where they design and build a robot to excavate and collect simulated Martian soil samples. The team sources individual components for their robot, including motors, sensors, and controllers which gives them more flexibility in their options to design how their robot functions.

Make sure it measures up

## EXAMPLES

**INDIVIDUAL COMPONENTS:** Users need to identify and source individual components for their robotics project, such as motors, sensors, controllers, and power sources. Users should take into consideration factors such as size, weight, power consumption, and interface compatibility.

**VENDOR AND SUPPLIER LISTS:** Users should compile lists of reputable vendors and suppliers for the components they need, including online retailers, specialty electronics stores, and manufacturer websites. This can involve conducting research, reading reviews, and comparing prices to ensure the best quality and value.

**DESIGN AND PLANNING DOCUMENTS:** Users may need to create design and planning documents to ensure their individual components are properly integrated into a cohesive system. This can involve creating circuit diagrams, schematics, and 3D models to visualize the project and identify potential issues before assembly.

## FORMULAS

**BILL OF MATERIALS (BOM):** A list of all the components required to build a robotics project, including individual components, quantities, and part numbers. This helps users to accurately estimate the cost of their project and ensure they have all the necessary components.

**COST ANALYSIS:** Comparing the cost of individual components from different vendors and suppliers to find the most cost-effective options. This involves analyzing the price per unit, shipping costs, and any additional fees or taxes.

**POWER CONSUMPTION:** Ensure that the power source can provide enough power to run all the components. This requires calculating the total power consumption of all the components and selecting an appropriate power source.

## APPLICATION

Drones have become an essential tool for precision agriculture, allowing farmers to collect data on crop health, moisture levels, and other variables that can affect crop yield and quality. By moving away from pre-made drone kits and sourcing individual components, companies and individuals can create customized drones that meet the specific needs of the agriculture industry. They can source high-quality cameras, GPS systems, and sensors to collect precise data, and integrate them into the drone's control system to create a comprehensive data collection platform.

Many drone vendors will source individual components for their drones, including high-quality cameras, LIDAR sensors, and GPS systems, and integrate them into a customized drone platform. This allows them flexibility when collecting precise data on crop health, moisture levels, and other variables, providing farmers with valuable insights to improve their crop yields and reduce waste.



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