**Senior Design Group 2**

***AutoVent***

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Idea Credit: Ed Rowland

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**Abstract**

Automotive firms that manufacture heating, ventilation, and air conditioning (HVAC) systems attempt to go beyond the technical limitations to satisfy the needs of their customers by streamlining lowering weight, size, and expense. Demanding results of a higher caliber than those of the past is, however, frequently hard to provide. Engineers and academics have paid more attention to the identification of issues, their characterization, and prognosis in relation to HVAC in the context of enhancing customer satisfaction.

The purpose of determining customer satisfaction is to meet their needs, focusing on the satisfaction of demanding customers and the desired level of performance. The tasks of quality control systems are to identify, analyze and control, based on customer reports, the main failure modes that lead to the root causes and generated problems in HVAC systems. In recent years, engineering and technological advances have progressively improved automotive thermal management. Motivational factors, the characteristics of new vehicles and their small size, the increase in the number of electric vehicles, the concern of consumers regarding fuel consumption, as well as consumer demands and political impacts have contributed to the importance of this field .

The components of a ventilation system include mechanical, electrical, and ergonomic elements. Subjected to stress, there is the possibility of reducing their life cycles and the reliability of the system must be evaluated for the purpose of planning and setting maintenance and repair tasks. The HVAC control systems in vehicles must always be developed to meet the demands of customers who want more comfort and luxury.

The Autovent will reduce stress on the cooling system, internal vehicle components, and personal belongings, while providing the user with a more comfortable experience.

**Description**

The AutoVent is an automobile cabin-air ventilation device: it is specifically designed to cycle ambient outside air into the cabin to help alleviate rising temperatures in a static vehicle. The low voltage fan will utilize the existing cabin-air filtration system and be modulated with a thermostat and microcontroller to pump outside air into the cabin when the interior temperature reaches a setpoint.

**Product Advantages**

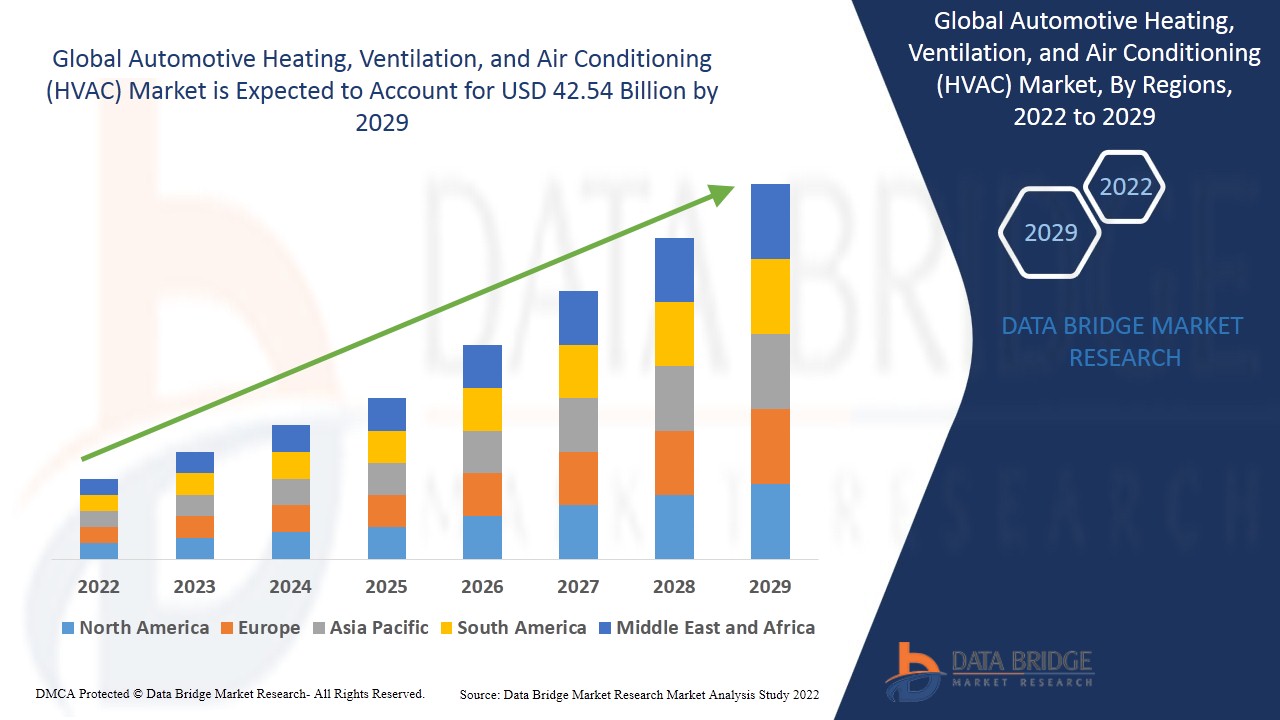
Existing competitive designs use window mounted fans, where the window must be slightly lowered, and the parked vehicle is exposed to water or dust intrusion in the event of adverse weather. The AutoVent’s integration into the existing cabin air system will allow for relatively normal day-to-day activity, where the user doesn’t need to fumble with any cumbersome devises or consider the weather.

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| --- | --- | --- | --- |
|  | Solar Powered | Discrete | Durable |
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**Feasibility**

The design is an improvement on existing products and solves a relatively simple(yet significant) problem. It will also use common and inexpensive components; a prototype should be deliverable within the allotted timeframe. While the design specifications are in progress, the proposed materials will include a low profile and low voltage fan, microcontroller, thermostat, and photocells.

**Market**

[](https://www.databridgemarketresearch.com/reports/global-automotive-heating-ventilation-and-air-conditioning-market)

Global automotive heating, ventilation, and air conditioning (HVAC) market was valued at USD 20.43 billion in 2021 and is expected to reach USD 42.54 billion by 2029, registering a CAGR of 9.60% during the forecast period of 2022-2029. “Automatic” accounts for the largest technology segment in the respective market owing to the increase in the demand for cars in developing nations. The market report curated by the Data Bridge Market Research team includes in-depth expert analysis, import/export analysis, pricing analysis, production consumption analysis, and pestle analysis.

**Milestones**

September 23, 2022 – Choose idea

October 23, 2022 – Complete design and material list

November 1, 2022 – have all parts on hand, begin assembly. Troubleshoot potential design fitment issues

December 1, 2022 – Begin product testing

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| --- | --- | --- |
| TEAMS |  | 9 – 23- 2022 |
| Meeting Location |  | Meeting Date |
|  |  |  |
| AutoVent |  | Johnny Hughes |
| Project Name |  | Meeting Coordinator |
|  |  |  |
| Present: ALL |  | Distribution: |
|  |  | Project Team |

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| Item No. | Action items to be completed | Responsible team member | Date Action Should be Completed By |
| --- | --- | --- | --- |
|  |  |  |  |
| 1. | Determine project | ALL | Sep. 23 |
| 2. | Research ventilation system and marketing data | Hassen | Oct. 4 |
| 3. | Initial photo/drawing, research design ideas | Johnny | Oct. 4 |
| 4. | Compile template, fill in gaps in assignment instruction | Chris | Oct. 4 |
| 5. |  |  |  |