Short Communication

**Brief Technical Report: Reduced Cost and Increased Versatility with New Mobile Office Signal Solution**

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**Abstract.** This paper presents the pilot solution of novel office signal system, which does not require installation costs, is moveable from premises to another, offers more features than conventional ones, and has the same level production costs than conventional solutions.

**Key words:** Constructive, office signal system, cost reduction, features

1. **INTRODUCTION**

One of the most common appliances in bureaus, institutions, and other office premises is the “traffic light” type office signal system. When we see that small white plastic box by the door with red, yellow, and green indicator lights, it hardly come to our mind that we see only small part of the system. The most of material is hidden inside the wall or it twists among the fitments. The clumpy cable between the devices limits the use of the system, and requires installation costs. It can be said that this old school system causes material loss and it is not ecological solution either. The frailties of conventional solutions are:

1.1. Costs

The conventional solution is unchangeable and unmovable part of the office premises. Therefore the installation costs are necessary consequences. Comparing to retail price of conventional system, it can be concluded that the production costs of novel system cannot be more than conventional ones’; rather less than that. Furthermore, in many cases it is a waste to install conventional system to every single office room. In many cases it is enough to have one moveable system in a floor.

1.2. Immobility

As mentioned, the conventional solution is unchangeable part of office premises. Therefore it is not possible, or at least not profitable, to change the places of devices at need. That might be a problem in a case of renovation, internal transfer, or when situated in modern variable premises. On the other words, the solution can not follow the needs.

1.3. Material loss

The conventional solution includes lots of mechanical parts, for example wires, indicator lights, switches, and connectors, which are not needed when using technology of the moment.

1.4. Primitive features

The conventional solution gives only limited information to the users. This technical report introduces the pilot program which attempt to solve defined problems.

2. **MATERIALS AND METHODS**

The research method of this study is Design Science. It seeks the innovations, such as ideas, practices, technical capabilities, and products that can be efficiently accomplished for solving the problems faced in the real world (e.g. Denning, 1997; Lukka, 2003; Tsichritzis, 1998). March and Smith (1995) define four types of Design Science products: constructs, models, methods, and implementations. Brady et al (2012) emphasize, that design scientists aspire to create models, methods, and implementations that are innovative and valuable for both theory development and practice improvement. We see this study strongly in improvement to practice side. The prototype was first defined by light requirement analysis. The uniqueness was ensured by successful patent application in Finland (National Board of Patents and Registration in Finland, 2010). Finally, the prototype (lower part of Fig. 2) was built using the open platform hardware.
3. RESULTS AND DISCUSSIONS

The proposed solution consists of two identical wireless devices. The first device is placed outside the target space (e.g., office room, meeting room) by the door, and the second device is inside the target space. The devices are connected via wireless ad hoc network using suitable distribution method (external network is not needed). The pilot system uses Wireless Local Area Network (WLAN). The environment of the solution is illustrated in figure 1.

![Fig. 1: Environment of solution (Sarja, 2010).](image)

The devices are equipped with rechargeable batteries, which enable the mobility. The standard touch screen is cheap and enables broader user interface (UI) with changing screens and buttons. The broader UI is needed for more features. The UI of pilot version is divided into two different pages: the main page for traffic lights and the message page will show and handle text and voice messages functionalities. The example of different pages is illustrated in upper part of figure 2.

![Fig. 2: Prototype and examples of different user interfaces.](image)

The pilot system is equipped by two different messaging systems for getting more exact information than just “traffic lights”. Push-to-talk type voice message enables to communication between the spaces, e.g., corridor and office room. If it is not possible to talk (e.g., in a case of teleconference), the short text messages are possible to send between devices. The messages appear to active traffic light field.

3.1. Scenarios

In this chapter the simplified use cases are introduced.

1. A small company has purchased the novel office signal system. One wireless moveable system substitutes the need for installing conventional systems to every office rooms. It is used often by the meeting room.

2. The individual comes to meet an office worker. (S)he presses the call button in a touch screen of the office signal system. The office worker presses the color button according to condition.

3. The individual comes to meet an office worker. (S)he presses the call button in a touch screen of the office signal system. The office worker discusses with the individual using the voice mail of the system, and they decide to meet after five minutes. The use case is illustrated in.

4. The office worker has a teleconference. The individual comes to meet an office worker. (S)he presses the call button in a touch screen of the office signal system. The office worker is not able to talk because of teleconference. Instead, (s)he send the text message to individual outside the room. The individual read the message from the red light in device by the door. They decided to meet after one hour when the teleconference ends. The use case is illustrated in.

The developed prototype is a study, which demonstrates technical functionality of the novel office signal system. Still, there are few questions to solve. The charging process must be rationalized. One solution could be a mobile phone type battery charging stand. The other consideration is the attachment of the device outside the room. With pilot devices the temporary solution was simple tab and screw attachment. Perhaps the biggest open issue is the revenue logic of the system. Comparing the conventional systems, it is not easy to define the final customer. When the conventional systems are mostly purchased by building-, construction-, or installation firms, the novel systems can be purchased also by individuals. Naturally this reflects strongly for the choice of distribution channel.
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REFERENCES


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